HP 7500 Switch Series

Installation Guide

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Preparing for installation

The HP 7500 Switch Series includes the models in Table 1.

Table 1 HP 7500 Switch Series

Product code	Description	Alias
JD242B	HP 7502 Switch Chassis	7502
JD243B	HP 7503-S Switch Chassis	7503-S
JD240B	HP 7503 Switch Chassis	7503
JD239B	HP 7506 Switch Chassis	7506
JD241B	HP 7506-V Switch Chassis	7506-V
JD238B	HP 7510 Switch Chassis	7510

Safety recommendations

To avoid possible bodily injury and equipment damage, read all safety recommendations carefully before installation. Note that the recommendations do not cover every possible hazardous condition.

General safety recommendations

- Keep the chassis clean and dust-free.
- Do not place the switch on a moist area, and avoid liquid flowing into the switch.
- Make sure the ground is dry and flat and anti-slip measures are in place.
- Keep the chassis and installation tools away from walk areas.
- Do not wear loose clothing, jewelry (for example, necklace) or any other things that could get caught in the chassis when you install and maintain the switch.

Electricity safety

- Clear the work area of possible hazards, such as ungrounded power extension cables, missing safety grounds, and wet floors.
- Locate the emergency power-off switch in the room before installation so you can quickly shut power off when an electrical accident has occurred.
- Unplug all external cables, including power cords, before moving the chassis.
- Do not work alone when the switch has power.
- Never assume that power has been disconnected from a circuit. Always check.

Handling safety

CAUTION:

- When moving the switch, hold the handles at both sides of the chassis.
- Do not hold the handle of the fan assembly, power supply, or back cover of the chassis, or the air vents of chassis. Any attempt to move the switch with these parts might cause equipment damage and even bodily injury.

When you move an HP 7500 switch, follow these guidelines:

- Remove all external cables, including the power cords, before moving the chassis.
- Moving the chassis requires at least two persons, and you can use a mechanical lift as needed.
- Lift and put down the chassis slowly and never move suddenly.

ESD prevention

To prevent electric components from being damaged by electrostatic discharge (ESD), follow these guidelines:

- Ground the switch correctly. For how to ground your switch, see "Installing the switch."
- Always wear an ESD wrist strap and make sure it is well grounded when installing FRUs. For how to use an ESD wrist strap, see "Installing FRUs."
- Hold a PCB by its edges. Do not touch any electronic components or printed circuit.
- Put cards away in ESD bags for future use.

Laser safety

WARNING!

Do not stare into any fiber port when the switch has power. The laser light emitted from the optical fiber might hurt your eyes.

The 7500 switches are class 1 laser products.

Examining the installation site

The 7500 switches must be used indoors. To ensure normal operation and long service life of your switch, the installation site must meet the requirements in this section.

Floor loading

Make sure the floor can support the total weight of the rack, chassis, cards, power supplies, and all other components. Additionally, the floor loading plan must also consider system expansion, such as adding more cards.

Temperature

CAUTION:

If condensation appears on the chassis when you move it to a high-temperature environment, dry the chassis before powering it on to avoid short circuits.

To guarantee the normal operation of the switch, the room temperature must meet the requirements in Table 2.

Table 2 Temperature requirements

Temperature	Range
Operating temperature	0°C to 45°C (32°F to 113°F)
Storage temperature	–40°C to +70°C (–40°F to +158°F)

Humidity

Maintain appropriate humidity in your equipment room, as described in Table 3.

- Lasting high relative humidity tends to cause poor insulation, electricity creepage, mechanical property change of materials, and corrosion of metal parts.
- Lasting low relative humidity is likely to result in loose screws due to washer contraction, and even ESD, which causes the circuits to fail.

Table 3 Humidity requirements

Humidity	Range
Operating humidity	10% to 95%, noncondensing
Storage humidity	5% to 95%, noncondensing

Cleanness

Dust buildup on the chassis might result in electrostatic adsorption, which causes poor contact of metal components and contact points, especially when indoor relative humidity is low. In the worst case, electrostatic adsorption can cause communication failure.

Table 4 Dust concentration limit in the equipment room

Substance	Concentration limit (particles/m^3)
Dust particles	≤ 3×10^4 (No visible dust on desk in three days)
NOTE: Dust particle diameter ≥ 5 μm	

The equipment room must also meet strict limits on salts, acids, and sulfides to eliminate corrosion and premature aging of components, as shown in Table 5.

Table 5 Harmful gas limits in an equipment room

Gas	Maximum concentration (mg/m^3)
SO_2	0.2
H_2S	0.006
NH_3	0.05
Cl_2	0.01

EMI

All electromagnetic interference (EMI) sources, from outside or inside of the switch and application system, adversely affect the switch in a conduction pattern of capacitance coupling, inductance coupling, electromagnetic wave radiation, or common impedance (including the grounding system) coupling. To prevent EMI, take the following actions:

- Take measures against interference from the power grid.
- Use a grounding system and lighting protection system for the switch separate from those for other electric equipment, and keep them far away as possible.
- Keep the switch far away from radio transmitting stations, radar stations, and high-frequency devices.
- Use electromagnetic shielding, for example, shielded interface cables, when necessary.
- Route interface cables only indoors to prevent signal ports from getting damaged by over-voltage or over-current caused by lightning strikes.

Grounding

Using a good grounding system to protect your switch against lightning shocks, interferences, and ESD is essential to the operating reliability of your switch.

Make sure the resistance between the chassis and the ground is less than 1 ohm.

Power

Perform the following tasks to meet the power requirements:

1. Calculate the total power consumption

   The total power consumption varies by card type and density and fan assembly power consumption. If the switch provides PoE power, the total power consumption must also include PoE power consumption. For more information about total power consumption calculation, see "Appendix A Chassis views and technical specifications."

2. Select power supplies and identify the number of power supplies

   The total maximum output power of all power supplies must be higher than the total power consumption of the switch. For more information about available power supplies, see "Appendix B FRUs and compatibility matrixes."

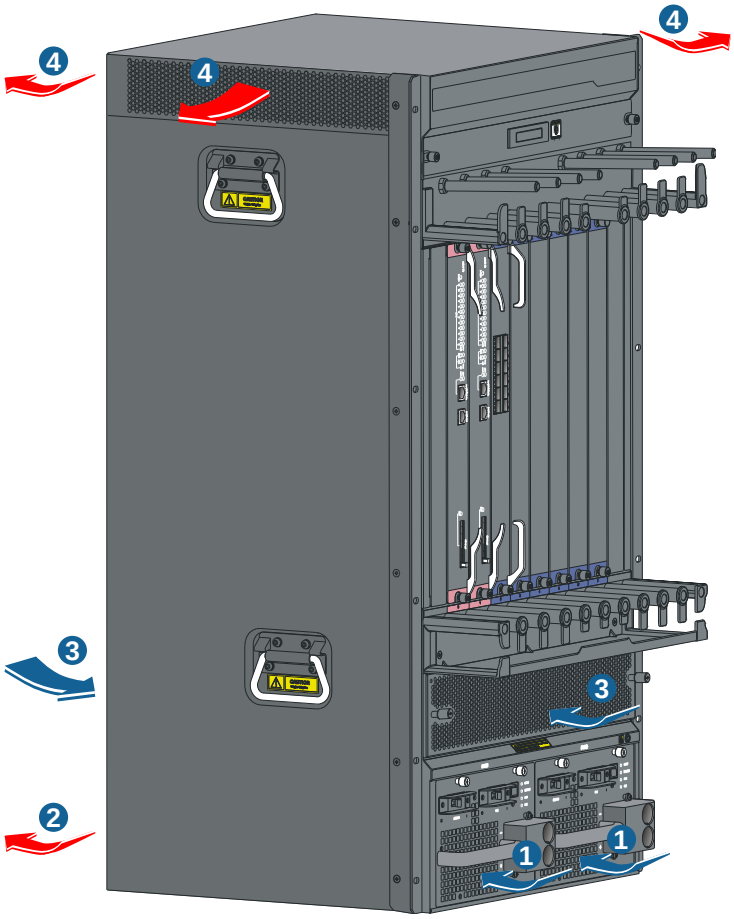
3. Verify that the power supply system at the installation site meets the requirements of the power supplies, including the input method and rated input voltage.

Cooling

Plan the installation site for adequate ventilation.

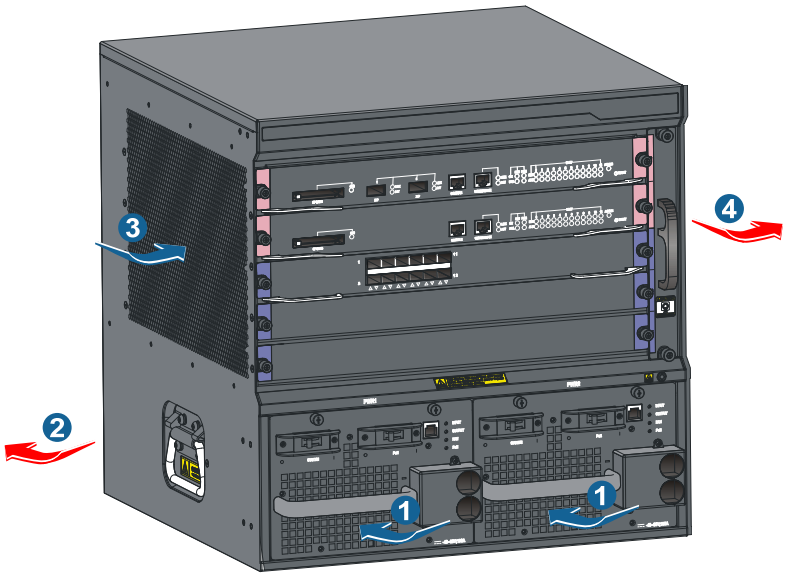
- Leave at least 10 cm (3.94 in) of clearance at the inlet and outlet air vents.
- The rack for the switch has a good cooling system.
- The installation site has a good cooling system.
- Verify that the airflow design of the chassis meets the airflow design of the installation site.

Figure 1 Airflow through the 7506-V chassis



(1) Inlet air vents for the power supplies	(2) Outlet air vents for the power supplies
(3) Inlet air vents for the chassis	(4) Outlet air vents for the chassis

Figure 2 Airflow through other 7500 switch chassis



(1) Inlet air vents for the power supplies	(2) Outlet air vents for the power supplies
(3) Inlet air vents for the chassis	(4) Outlet air vents for the chassis

Space

For easy maintenance, follow these guidelines:

- Reserve at least 1 m (3.28 ft) of clearance between the rack and walls or other devices.
- The equipment room is at least 3 m (9.84 ft) high.

Installation tools

Table 6 lists the tools and equipment that you might need during installation. All of them are user supplied.

Table 6 Installation tools and equipment

Category	Tool
Measuring and marking tools	Long tape, ruler (of 1 meter), gradienter, marker, chalk line, and pencil
Drills	Percussion drill, electric drill, and several auxiliary drill bits
Fastening tools	Flat-blade screwdriver P4-75 mm Phillips screwdriver P1-100 mm, P2-150 mm, and P3-250 mm Socket wrench M5 Socket wrench M6
Small tools	Needle-nose pliers, diagonal pliers, combination pliers, wire-stripping pliers, crimping pliers, RJ-45 crimping pliers, file, and handsaw
Auxiliary tools	ESD wrist strap, hair brush, tweezers, paper knife, hand bellows, electric iron, solder wire, ladder, cable stripper, vacuum cleaner, crowbar, and rubber hammer

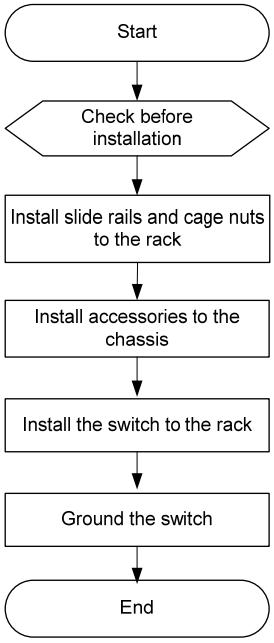
Category	Tool
Tools for fiber-optic cleaning	Lint-free paper and optical fiber microscope
Equipment	Multimeter, 500 V Megohmmeter for measuring the insulation resistance, error detector, optical power meter, and earth resistance tester

Installing the switch

IMPORTANT:

Keep the packages of the switch and the components for future use.

Figure 3 Hardware installation flow


Start
Check before installation
Install slide rails and cage nuts to the rack
Install accessories to the chassis
Install the switch to the rack
Ground the switch
End

Confirming installation preparations

Before you install the 7500 switch, verify that:

- You have read the chapter "Preparing for installation" carefully and the installation site meets all the requirements.
- A 19-inch rack is ready for use. For how to install a rack, see the rack installation guide.
- The rack is sturdy and securely grounded.
- No debris exists inside or around the rack.
- Choose a correct rack mounting position for the switch. Make sure the heaviest device is placed at the bottom of the rack.
- The switch is ready for installation and has been carried to a place near the rack.

Attaching slide rails and cage nuts to the rack

Installing slide rails

If the rack has slide rails, skip this section.

Before you attach slide rails to the rack, confirm the following items:

- The slide rails can support the weight of the switch. For the weights of the 7500 switches, see "Appendix A Chassis views and technical specifications."

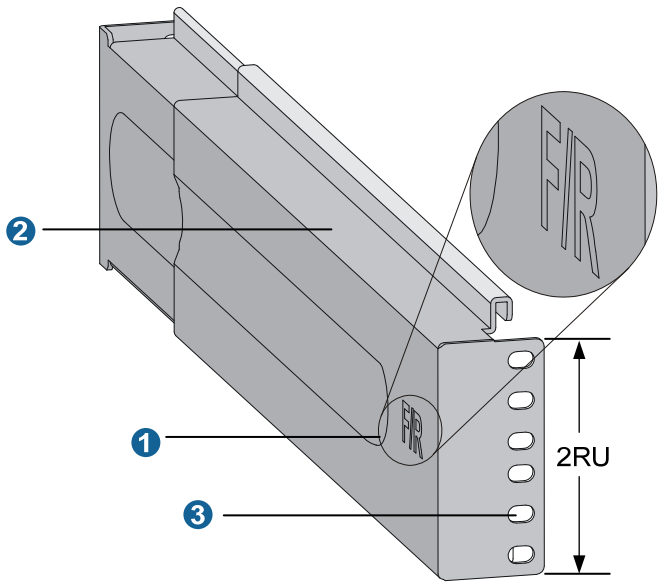
  HP recommends that you order the HP X421 A-Series Chassis Universal 4-Post Rack Mounting Kit (JC665A). For more information about the kit, see "Appendix B FRUs and compatibility matrixes."
- Identify the rack position for the switch. For the height and other specifications of the 7500 Switch Series, see "Appendix A Chassis views and technical specifications."

Slide rail installation varies by rack type. The following installation procedure is for your reference only.

To install a slide rail:

1. Read the signs on the slide rail (see Table 7) to avoid making a mistake.

Figure 4 Right slide rail



1RU (Rack Unit)=44.45mm(1.75 in)

(1) Sign	(2) Guide rail	(3)Installation hole

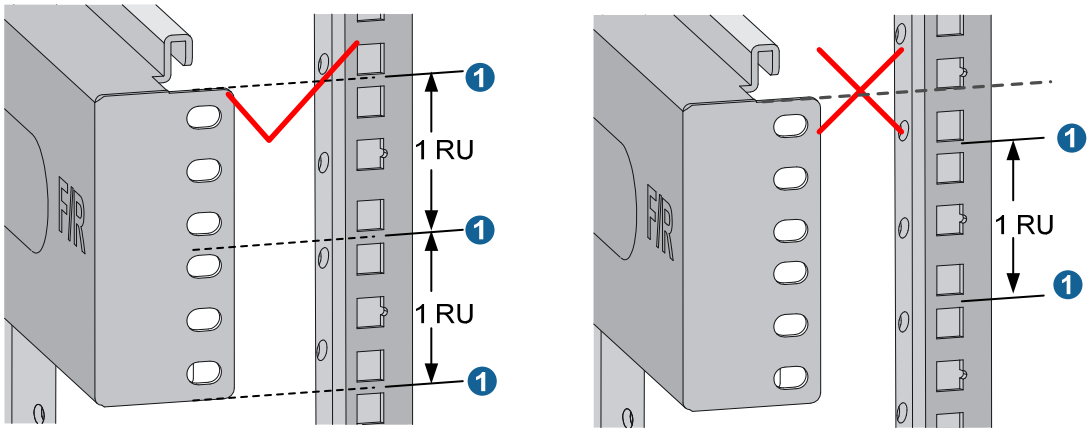
Table 7 Description of signs on the slide rails

Sign	Meaning	Remarks
F/L	Front end of the left slide rail	Mount this end to the front left rack post.
F/R	Front end of the right slide rail	Mount this end to the front right rack post.

2. Mark the position on the rack for installing the slide rail.
   a. Make sure the bottom edge of the slide rail aligns with the middle of the narrower metal area between holes, as shown in Figure 5.
   b. Each rack post requires six screws to fix the slide rail. You only need to mark the uppermost square hole and lowermost square hole for installation.
   c. Mark the square holes at the same height on the other three rack posts.

      One rack unit has three holes, the middle of which is an auxiliary installation hole, and the other two are standard installation holes. You can distinguish them by the space between each two holes. The space between a standard installation hole and an auxiliary installation hole is larger than that between two adjacent standard installation holes.

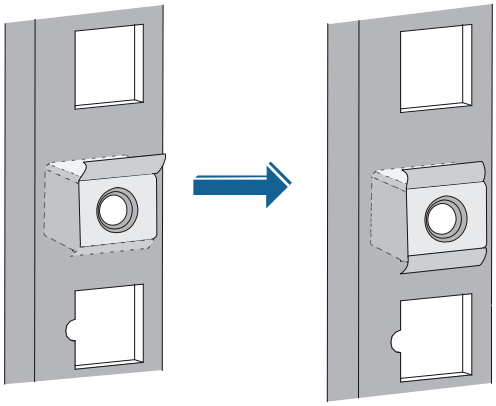
Figure 5 Locating the rack position for installing slide rails



(1) Middle of the narrower metal area between holes

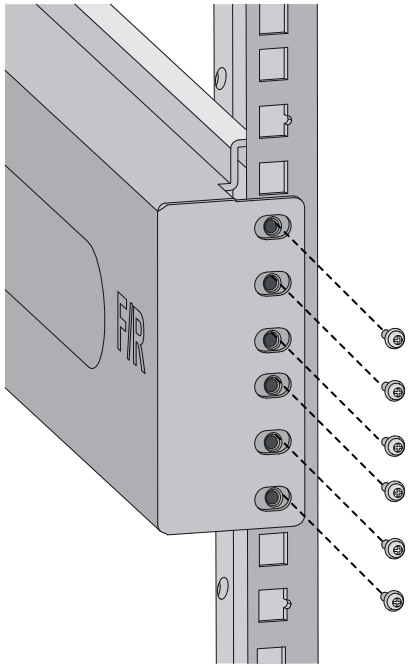
3. Install six cage nuts on the square holes in each rack post, as shown in Figure 6.

Figure 6 Installing a cage nut



4. Align the installation holes on the front end of the slide rail with the cage nuts on the front rack post, and attach them with screws, as shown in Figure 7.

Figure 7 Attaching the slide rail to the cage nuts with screws

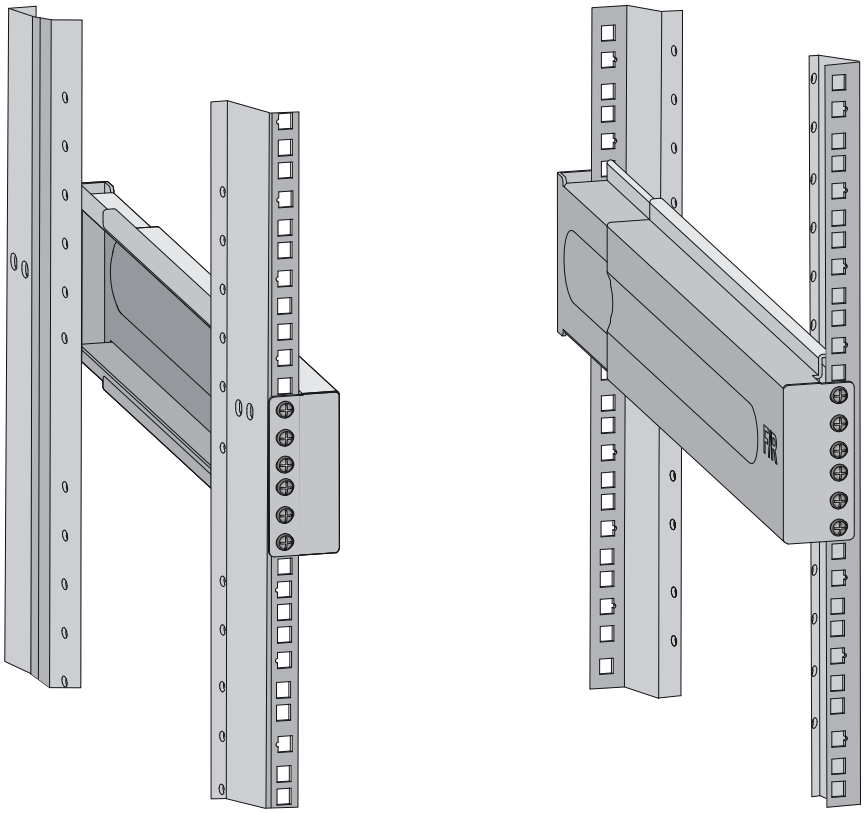


5. Keep the slide rail horizontally and adjust its length until the installation holes in the rear end of the slide rail touch the cage nuts on the rear rack post. Then screw in screws and fasten.

   Insert a screw in each mounting hole of the slide rail to ensure its weight bearing capacity.

6. Repeat steps 4 and 5 to install the other slide rail. Make sure the two slide rails are at the same height so that the device can be placed on them horizontally.

Figure 8 Installed slide rails

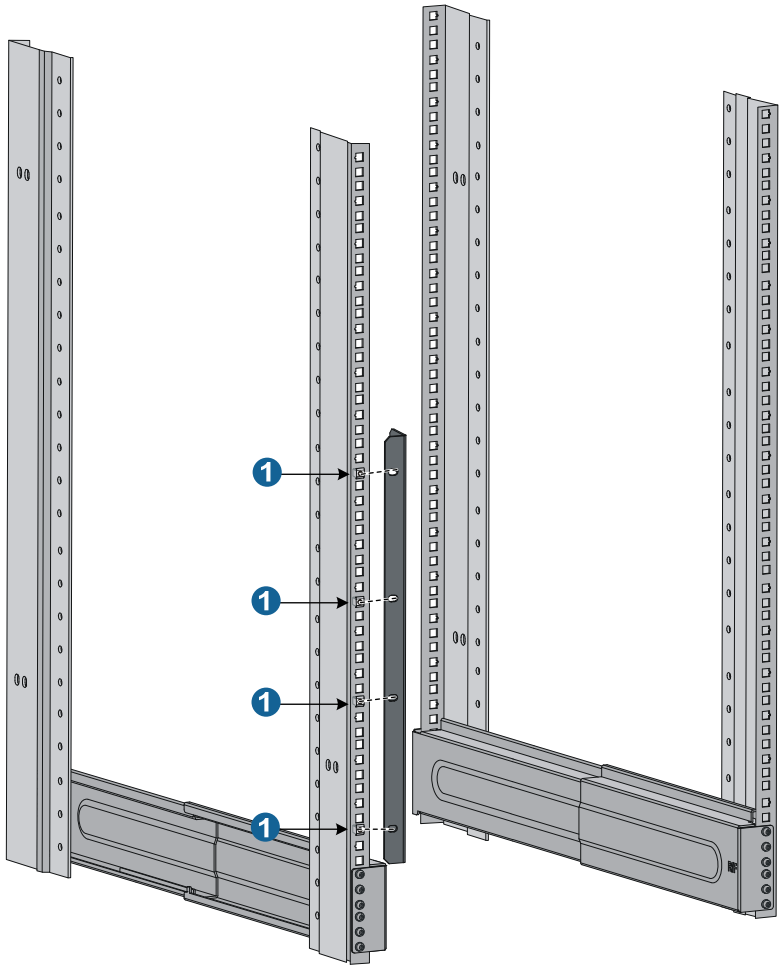


Installing cage nuts

Before mounting the chassis to the rack, install cage nuts to the front square-holed brackets of the rack.

1. As shown in Figure 9, determine the positions of the cage nuts according to the holes on the mounting brackets and positions of the slide rails.
2. Install cage nuts on the square holes on each rack post, as shown in Figure 6

Figure 9 Installing cage nuts (7503 as an example)



(1) Cage nut

Installing mounting brackets and cable management brackets

Before installing the switch to the rack, install the mounting brackets and cable management brackets shipped with the switch. Cable management brackets (signal cable and power cable management brackets) are used for cabling the switch, and mounting brackets are used for attaching the chassis to the rack.

- **7506-V**—Install the mounting brackets and cable management brackets separately to the chassis. For more information, see "Installing the cable management brackets on the 7506-V" and "Installing mounting brackets."
- **Other models**—Install the cable management brackets to the mounting brackets, and then install the mounting brackets to the chassis. For more information, see "Attaching the cable management brackets on other models" and "Installing mounting brackets."

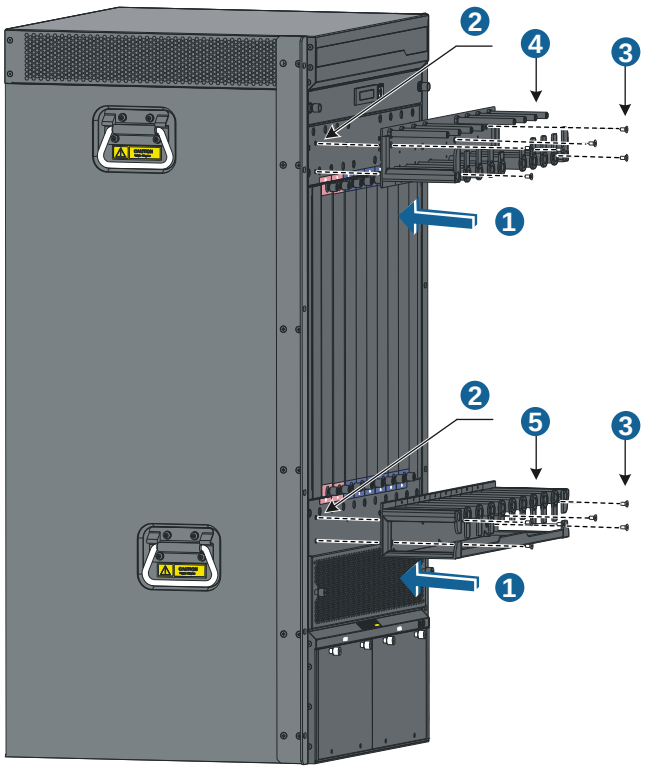
Installing the cable management brackets on the 7506-V

The 7506-V has two cable management brackets—the one with a tray is installed at the lower part of the switch, and the one without a tray is installed at the upper part of the switch. They are installed in the same way.

To install a cable management bracket:

1. Unpack the cable management brackets.
2. Attach the cable management bracket to the chassis, and align the screws with the screw holes in the chassis, as shown in Figure 10.
3. Fasten the screws.

Figure 10 Attaching cable management brackets on an HP 7506-V

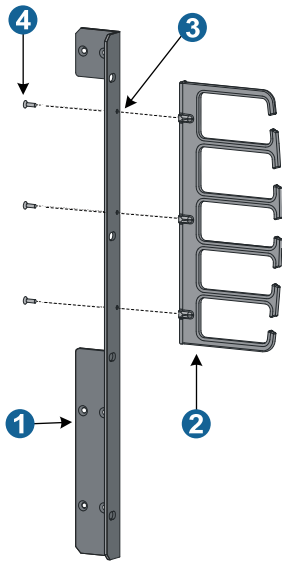


(1) Attach the cable management bracket to the chassis
(2) Screw holes for installing the cable management bracket
(3) Screws for fixing the cable management bracket to the chassis
(4) Cable management bracket without a tray (installed at the upper part of the chassis)
(5) Cable management bracket with a tray (installed at the lower part of the chassis)

Attaching the cable management brackets on other models

For the models except the 7506-V, install the cable management bracket on the left mounting bracket, as shown in Figure 11. The switch is supplied with two mounting brackets, and the one with the cable management bracket screw holes is the left mounting bracket.

Figure 11 Attaching the cable management bracket to the left mounting bracket



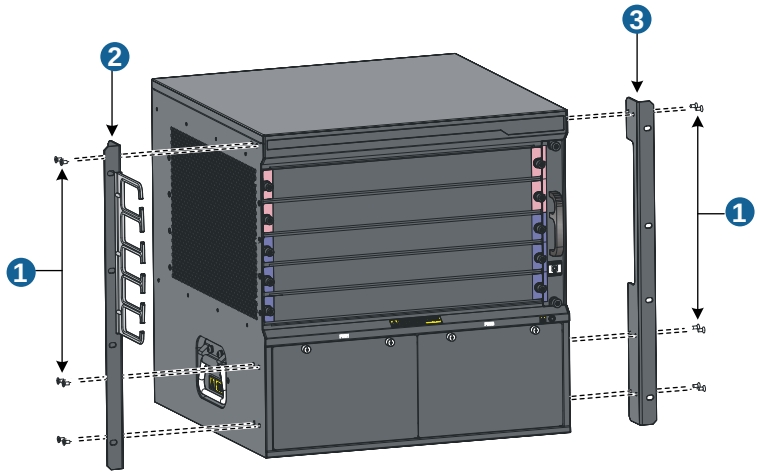
(1) Left mounting bracket	(2) Cable management bracket
(3) Screw hole for installing the cable management bracket	
(4) Screw for fixing the cable management bracket to the left mounting bracket	

Installing mounting brackets

Before installing the switch to the rack, install the mounting brackets to the chassis, as shown in Figure 12.

- **7506-V**—Facing the front of the switch, mount the left and right mounting bracket to the two sides of the switch.
- **Other models**—Facing the front of the switch, mount the mounting bracket with a cable management bracket to the left of the switch, and mount the mounting bracket without a cable management bracket to the right of the switch (where the fan assembly is located).

Figure 12 Installing the mounting brackets (7503)



(1) Screws for fixing the mounting brackets to the chassis	(2) Left mounting bracket
(3) Right mounting bracket	

Mounting the switch to the rack

CAUTION:

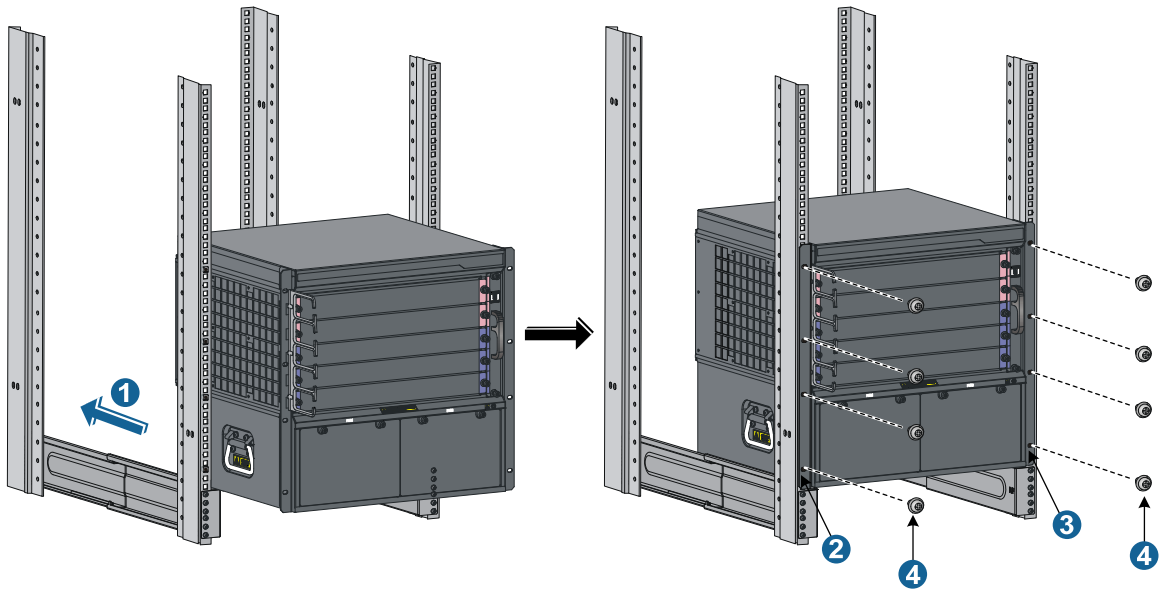
- Do not hold the handle of the fan assembly, power supply, or the back cover of the chassis, or the air vents of chassis. Any attempt to carry the switch with these parts might cause equipment damage or even bodily injury.
- After placing the switch on the slide rails, do not leave go of your hands immediately because this might tip the switch, damaging the switch or even causing bodily injury.

To mount the switch in the rack:

1. Move the chassis to face the rear of the chassis towards the front of the rack.
2. Use at least two persons to lift the switch until the bottom of the switch is a little higher than the slide rails on the rack.

   HP recommends using a mechanical lift for moving your switch.
3. Place the switch on the slide rails and slide the switch along the slide rails until the mounting brackets on the switch touch the front rack posts, as shown in callout 1 on Figure 13.
4. Attach the chassis to the rack with mounting screws.

Figure 13 Installing the chassis to the rack (7503)



(1) Slide the chassis into the rack	(2) Left mounting bracket
(3) Right mounting bracket	(4) Screws for fixing the mounting brackets to the rack

If the screw holes in the mounting brackets cannot align with the cage nuts on the rack, verify that the bottom edge of the slide rail aligns with the middle of the narrowest metal area between holes and that the cage nuts are installed in the correct holes.

Grounding the switch

CAUTION:

Before you use the switch, connect the grounding cable correctly to guarantee lightning protection and anti-interference of the switch.

Grounding the switch with a grounding strip

CAUTION:

- Use the supplied grounding cable (yellow-green grounding cable).
- Connect the grounding cable to the earthing system in the equipment room. Do not connect it to a fire main or lightning rod.

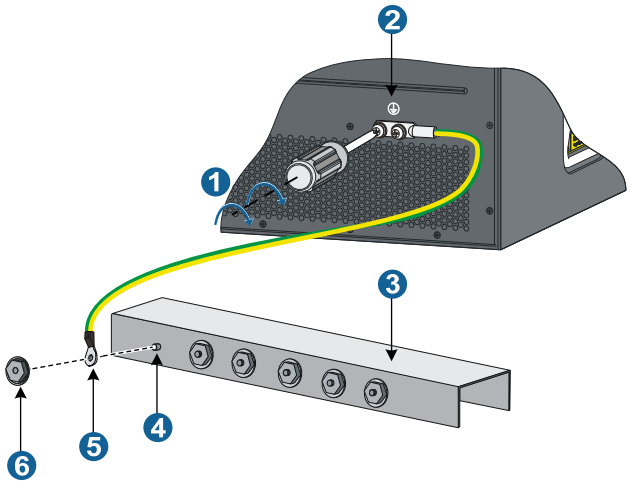
If a grounding strip is available at the installation site, connect the grounding cable through the grounding strip.

To connect the grounding cable:

1. Unpack the grounding cable.

   The grounding cable provided with the switch series is compliant with the NEBS standards.
2. Remove the grounding screws from the rear panel of the switch chassis, as shown in callout 2 on Figure 14.
3. Attach the grounding screw to the dual-hole terminal of the grounding cable.
4. Use a screwdriver to fasten the grounding screw into the grounding screw hole.
5. Connect the ring terminal of the grounding cable to the grounding post of the grounding strip, and fasten the grounding cable to the grounding strip with the hex nut.

Figure 14 Connecting the grounding cable to a grounding strip



(1) Attach the grounding screws with dual-hole terminals to the grounding holes		
(2) Grounding holes	(3) Grounding strip	(4) Grounding post
(5) Ring terminal	(6) Hex nut	

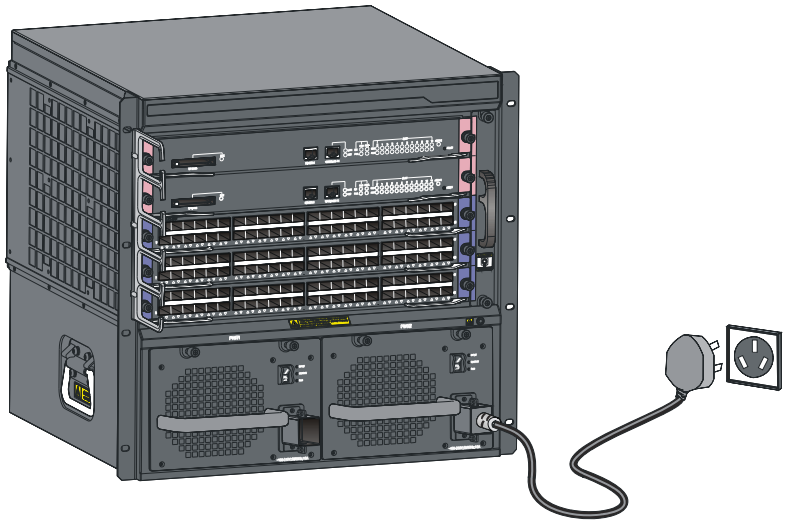
Grounding the switch through the PE wire of an AC power supply

If the installation site has no available grounding strips, you ground an AC-powered switch through the PE wire of the AC power supply.

CAUTION:

Make sure the AC power supply uses a three-wire cable with a protection wire, and the PE wire of the AC power supply is well grounded at the power distribution room or AC power supply transformer side. In addition, make sure the PE connector on the switch is well connected to the PE wire of the AC power supply.

Figure 15 Grounding through an AC power PE wire



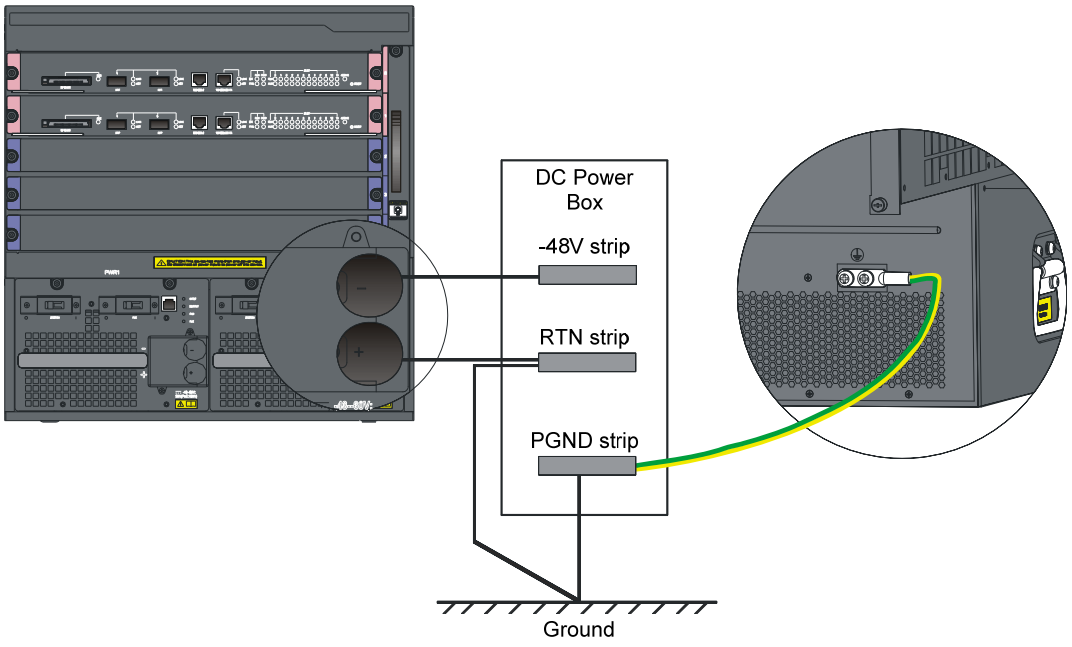
Grounding the switch through the RTN wire of a DC power supply

If the switch is powered by a –48 VDC power supply and no grounding strip is available at the installation site, you can ground the switch through the return (RTN) wire of the DC power supply, as shown in Figure 16.

CAUTION:

Make sure the RTN wire is well grounded from the DC egress of the DC power cabinet.

Figure 16 Grounding through the PGND of a power cabinet



Installing FRUs

There is no required order for installing FRUs. HP recommends that you connect power cords after completing installing all required FRUs.

TIP:

Keep the chassis and the component packages for future use.

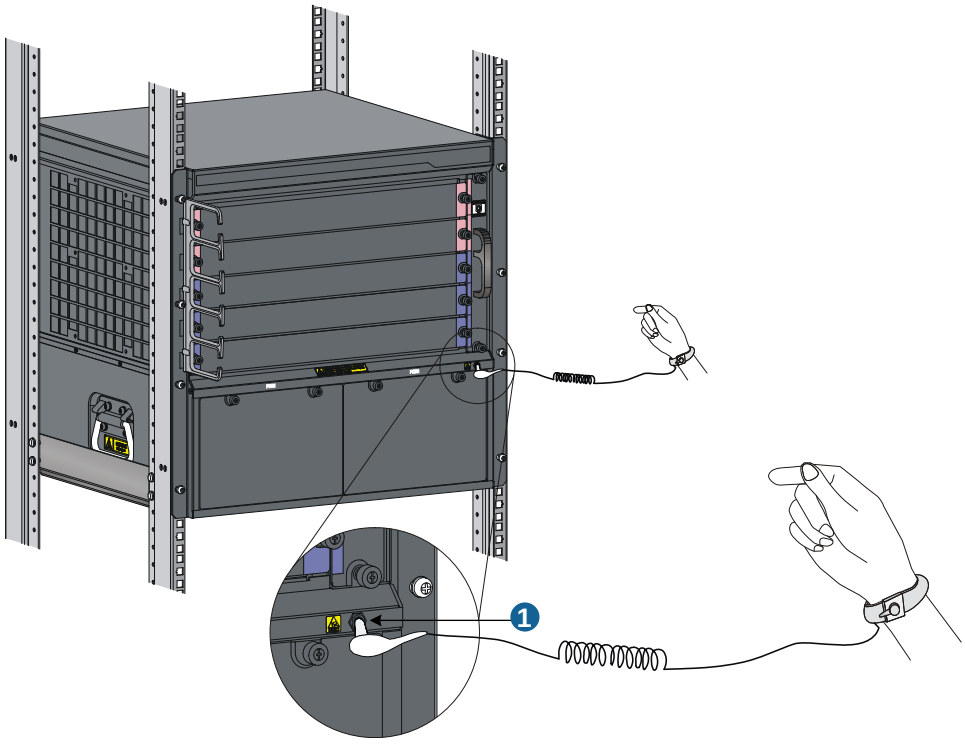
Attaching an ESD wrist strap

Every 7500 switch provides an ESD wrist strap. To minimize ESD damage to electronic components, wear an ESD wrist strap and ensure it is well grounded when installing modules.

To attach an ESD wrist strap:

1. Make sure the switch is well grounded. For how to ground your switch, see "Installing the switch."
2. Wear the wrist strap.
3. Tighten the wrist strap to keep good skin contact. Make sure the resistance reading between your body and the ground is between 1 and 10 megohms.
4. As shown in Figure 17, insert the ESD wrist strap into the ESD port on the switch chassis, or attach it to the grounding screw of the chassis with an alligator clip.

Figure 17 Attaching an ESD-prevent wrist strap (7503 as an illustration)



(1) ESD wrist strap port (having an ESD sign)

Installing a card

All the MPUs and LPUs for the switch series are hot swappable. The installation procedures for MPUs and LPUs are the same. Unless otherwise stated, MPUs and LPUs are collectively referred to as "cards" in this document.

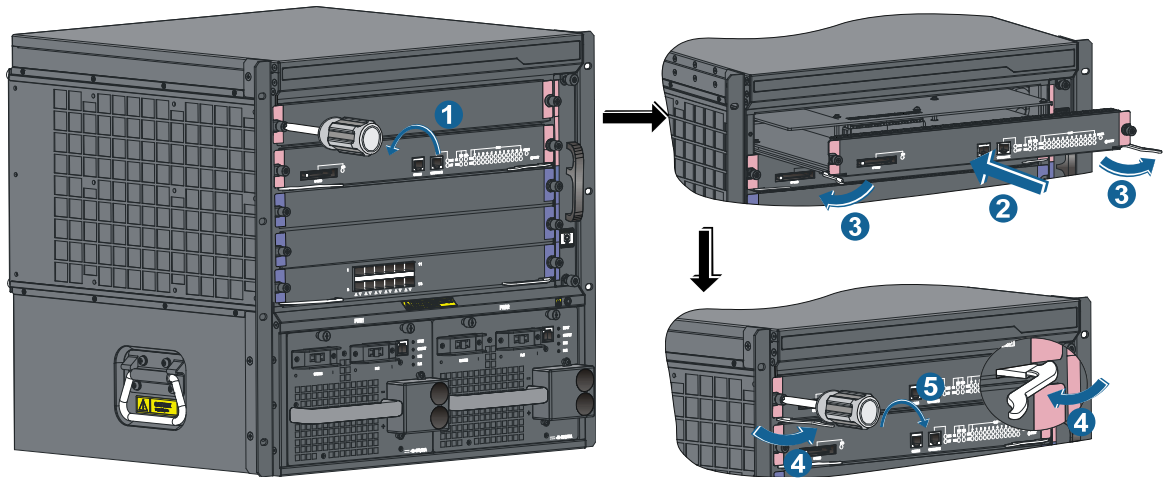
To install a card:

1. Wear an ESD wrist strap, and make sure it makes good skin contact and is well grounded. For more information, see "Attaching an ESD wrist strap."
2. As shown in callout 1 on Figure 18, remove the blank filler (if any) from the slot to be used. Keep the blank filler correctly for future use.
3. As shown in callout 2 on Figure 18, hold the card by the front panel with one hand and support the card bottom with the other (do not touch its circuit). Slide the card steadily into the slot along the guide rails.
4. As shown in callout 3 on Figure 18, when most part of the card is inserted in the slot, press the ejector levers on the card outward.
5. Push the card until the positioning pin on card touches the hole on the chassis.
6. As shown in callout 4 on Figure 18, press the ejector levers inward until the ejector levers touch the panel tightly and the card seats into the backplane.
7. As shown in callout 5 on Figure 18, fasten the captive screws on the card.
8. When the switch is powered on, examine the running status of the card.

   You can examine the running status of a card by referring to the card status LED (SLOT) on the MPU of the switch. If the RUN LED flashes, the card in the slot operates correctly. For more information about card status LED (SLOT), see "Appendix C LEDs."

   After the switch is powered on, you can examine the card running status at the command line interface (CLI). For more information, see "Hardware management and maintenance."

Figure 18 Installing a card



(1) Remove the blank filler	(2) Slide the card into the slot along the guide rails
(3) Press the ejector levers on the card outward	(4) Press the ejector levers on the card inward
(5) Fasten the captive screws	

Installing a power supply

CAUTION:

- For dual-grid input, the input voltage and frequency for the two grids must be the same.
- Provide a circuit breaker for each power supply and make sure the circuit breaker is off before installation.
- Do not install power supplies of different models on the same switch.
- To avoid power supply damage or bodily injury, support the bottom of a power supply instead of holding its handle for power supply movement.
- Before installing a power supply, make sure the power supply is switched off.
- Make sure the power of the power supply can satisfy the requirements of the switch.

The switch uses 1 + 1 power redundancy and supports AC and DC power input. You can select AC or DC power supply as needed. For more information about optional power supplies, see "Appendix B FRUs and compatibility matrixes."

Installing a power supply

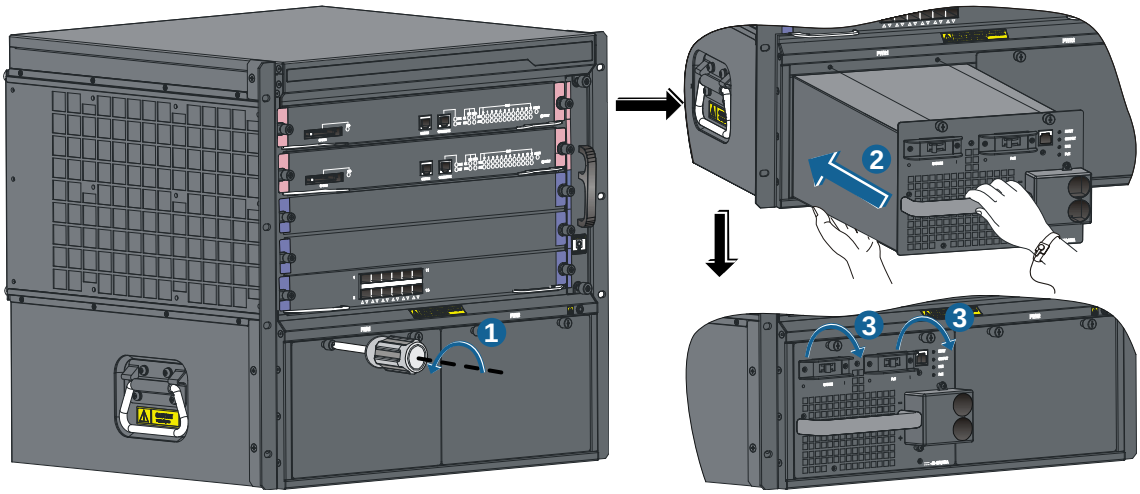
CAUTION:

If the captive screws cannot be fastened, verify that the power supply is correctly installed.

To install the power supply:

1. Wear an ESD wrist strap and make sure it makes good skin contact and is well grounded. For more information, see "Attaching an ESD wrist strap."
2. As shown in callout 1 on Figure 19, remove the blank filler (if any) from the slot to be used. Keep the blank filler correctly for future use.
3. Unpack the power supply, and verify that the power supply model is correct.
4. Be sure to insert the power supply with its upside up. Grasp the handle of the module with one hand and support the module bottom with the other.
5. As shown in callout 2 on Figure 19, gently push the power supply along the guide rails into the slot until it has firm contact with the slot.
6. As shown in callout 3 on Figure 19, use a Phillips screwdriver to fasten the captive screws on the power supply to secure the power supply into the chassis.

Figure 19 Installing a power supply



(1) Remove the blank filler	(2) Push the power supply along the guide rails into the slot
(3) Fasten the captive screws	

Follow the forward inertia of the power supply when inserting it into the chassis to ensure that the power supply has firm contact with the connector on the backplane.

To prevent damage to the power supply and the connection terminals on the backplane, be sure to pull out the power supply first in case of any misalignment, and then push it in again.

Connecting the power cord

⚠ WARNING!

Before connecting the power cord, make sure the power supply that connects to the power cord is switched off.

Table 8 Power cord connection for the 7500 Switch Series

Model	Power input (AC/DC)	PoE support	Power cord connection procedure
300W AC	AC	No	Connecting the 300W AC/650W AC power cord
650W AC	AC	No	Connecting the 300W AC/650W AC power cord
1400W AC	AC	No	Connecting a 1400W AC power cord
2800W AC	AC	Yes	Connecting a 2800W AC power cord
6000W AC	AC	Yes	Connecting a 6000W AC power cord
300W DC	DC	No	Connecting the 300W DC/650W DC power cord
650W DC	DC	No	Connecting the 300W DC/650W DC power cord
1400W DC	DC	Yes	Connecting the 1400W DC power cord

Typically 10 A busbars are available in the equipment room but the 1400W AC, 2800W AC, and 6000W AC power supplies require a 16 A power cord (AC), so you need to use a 16 A busbar, and

ensure that the AC power supply system can provide enough power. For the power cords used in different countries or regions, see "Appendix B FRUs and compatibility matrixes."

Connecting the 300W AC/650W AC power cord

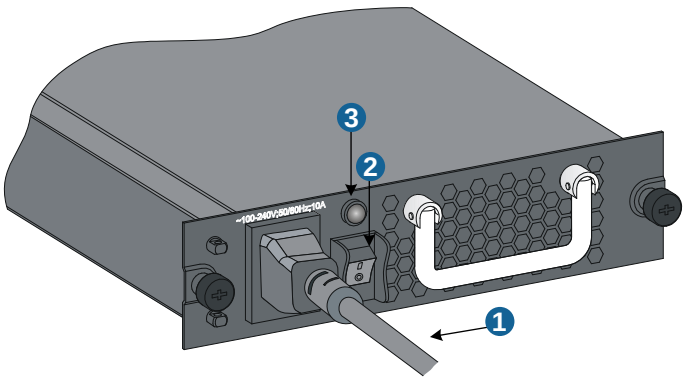
The 300W AC and 650W AC are built-in power supplies with AC input and DC output to supply power to the switch. Before connecting power cord, make sure the power switch is in the off position.

To connect the AC power cord:

1. Make sure of the power cord model (the 300W AC and 650W AC use a 10 A AC power cord).
2. Plug the power cord to the power receptacle on the power supply, and ensure a good contact.
3. Plug the other end of the power cord to the AC power strip of the AC power source.
4. Turn on the power switch.
5. Examine the power supply input status LED.

   If the LED is green, the power cord is correctly connected. If the LED is off or red, examine the installation, and solve the problem. Then switch on the power supply to verify that the LED is green. For description of 300W AC and 650W AC status LEDs, see "Appendix C LEDs."

Figure 20 Connecting an AC power cord

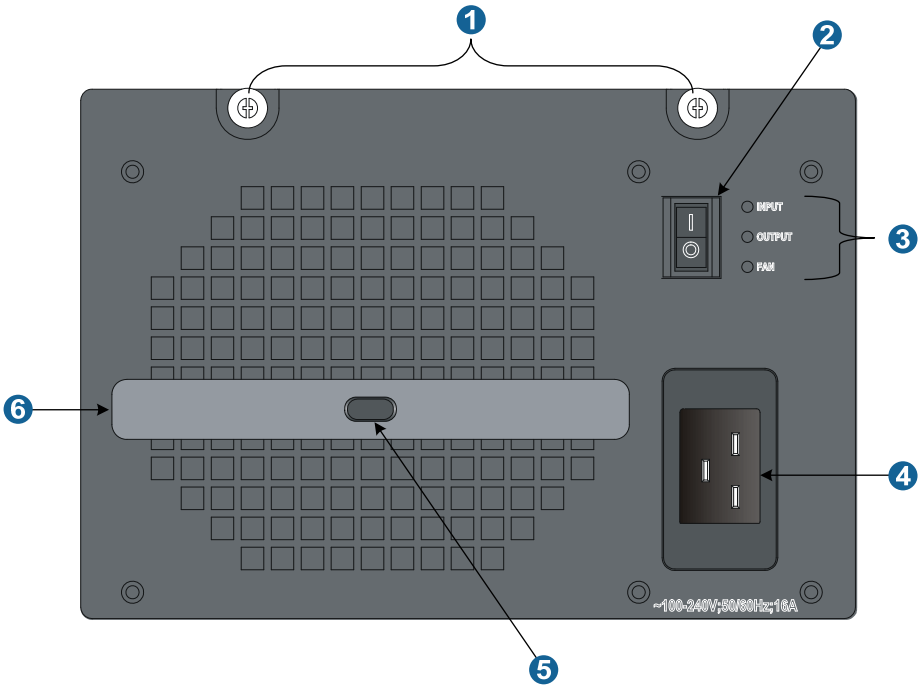


(1) AC power cord	(2) Power switch (**O** for off, and **|** for on)
(3) Power supply status LED	

Connecting a 1400W AC power cord

The 1400W AC is a built-in power supply with AC input and DC output to supply power to the switch. Before connecting power cord, make sure the power switch is in the off position.

Figure 21 Panel view of the 1400W AC



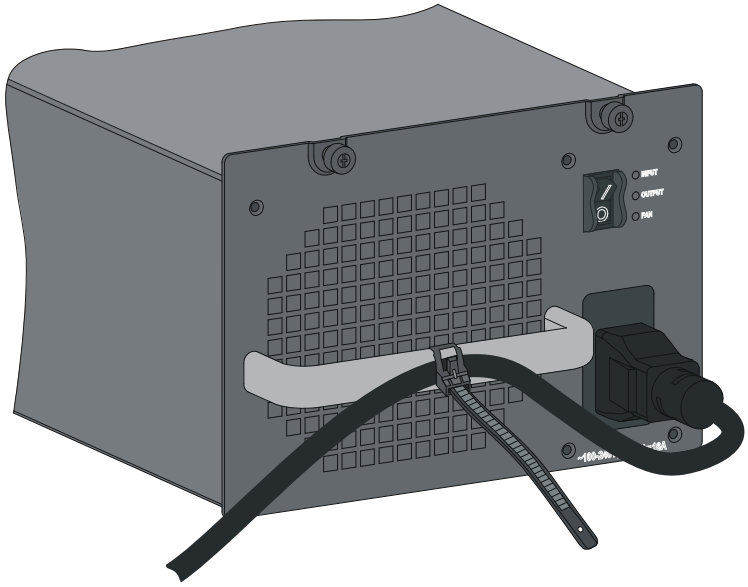
(1) Captive screws	(2) Power switch (**O** for off, and | for on)
(3) Status LEDs	(4) AC receptacle
(5) Hole for fixing a cable tie	(6) Power supply handle

To connect the AC power cord:

1. Make sure of the power cord model (the 1400W AC uses a 16 A AC power cord).
2. Plug the power cord to the power receptacle on the power supply, and ensure a good contact.
3. Secure the power cord to the power supply handle by using a cable tie, as shown in Figure 22.
4. Plug the other end of the power cord to the AC power receptacle of the power source.
5. Turn on the power switch.
6. Examine the power supply input status LED.

   If the LED is green, the power cord is correctly connected. If the LED is off or red, examine the installation, and solve the problem. Then switch on the power supply to verify that the LED is green. For description of 1400W AC status LEDs, see "Appendix C LEDs."

Figure 22 Connecting an AC power cord

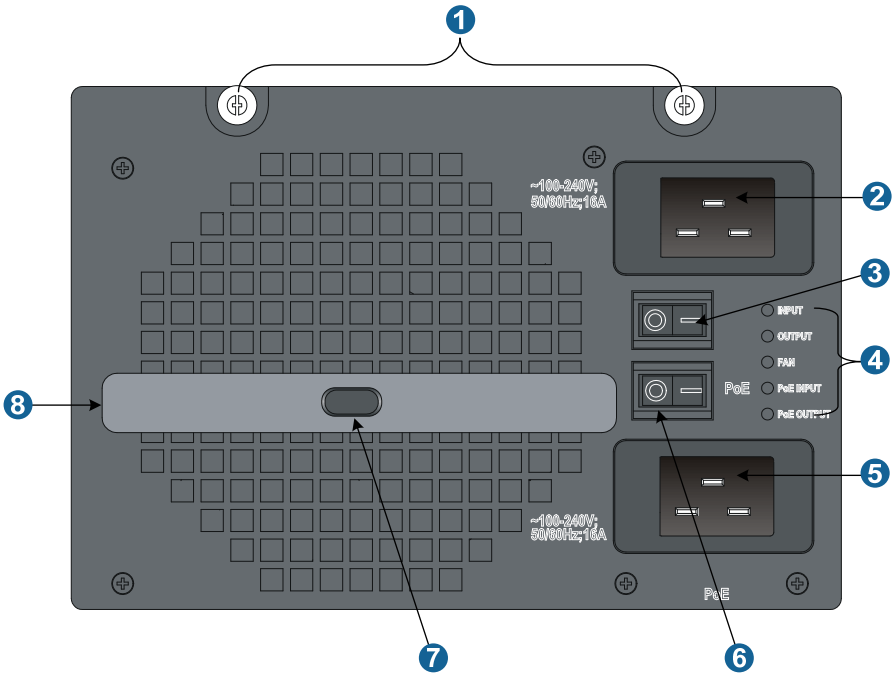


Connecting a 2800W AC power cord

The 2800W A is a built-in power supply with AC input and DC output. The 2800W AC power supply can provide the switch with both system power and PoE power, which can be controlled through separate switches. Before connecting power cord, make sure the system power switch PoE power switch both are in the off position.

The 2800W AC provides the system power receptacle (callout 2) and the PoE power receptacle (callout 5).

Figure 23 Panel view of the 2800W AC



(1) Captive screws	(2) System power receptacle
(3) Power switch (O for off, and — for on)	(4) Status LEDs
(5) PoE power receptacle	(6) PoE power switch (O for off, and — for on)
(7) Hole for fixing a cable tie	(8) Power supply handle

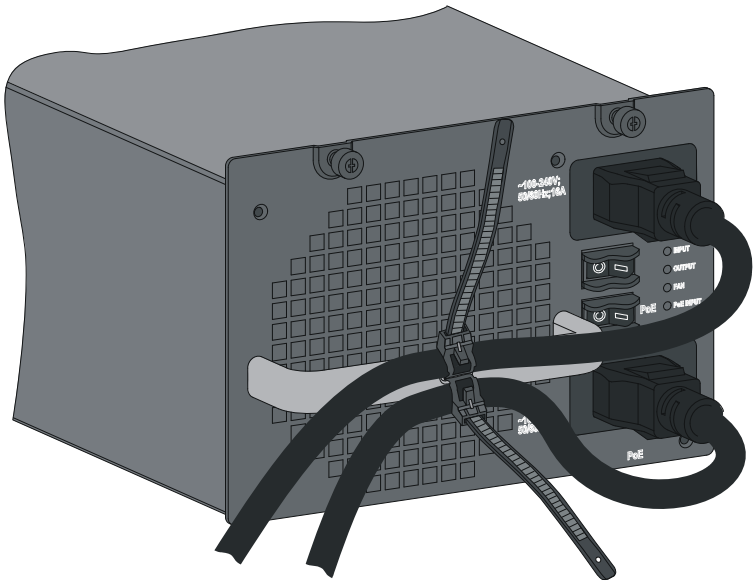
The power cord connection procedures are the same for the system power receptacle and PoE power receptacle of the 2800W AC power supply. This section takes the system power receptacle for example.

To connect the AC power cord to the system power receptacle of the power supply:

1. Make sure of the power cord model (the 2800W AC uses a 16 A AC power cord).
2. Plug the power cord to the system power receptacle on the power supply, and ensure a good contact.
3. Secure the power cord to the power supply handle by using a cable tie, as shown in Figure 24.
4. Plug the other end of the power cord to the AC power receptacle of the power source.
5. Turn on the power switch.
6. Examine the power supply input status LED.

   If the LED is green, the power cord is correctly connected. If the LED is off or red, examine the installation, and solve the problem. Then switch on the power supply to verify that the LED is green. For description of 2800W AC status LEDs, see "Appendix C LEDs."

Figure 24 Connecting an AC power cord

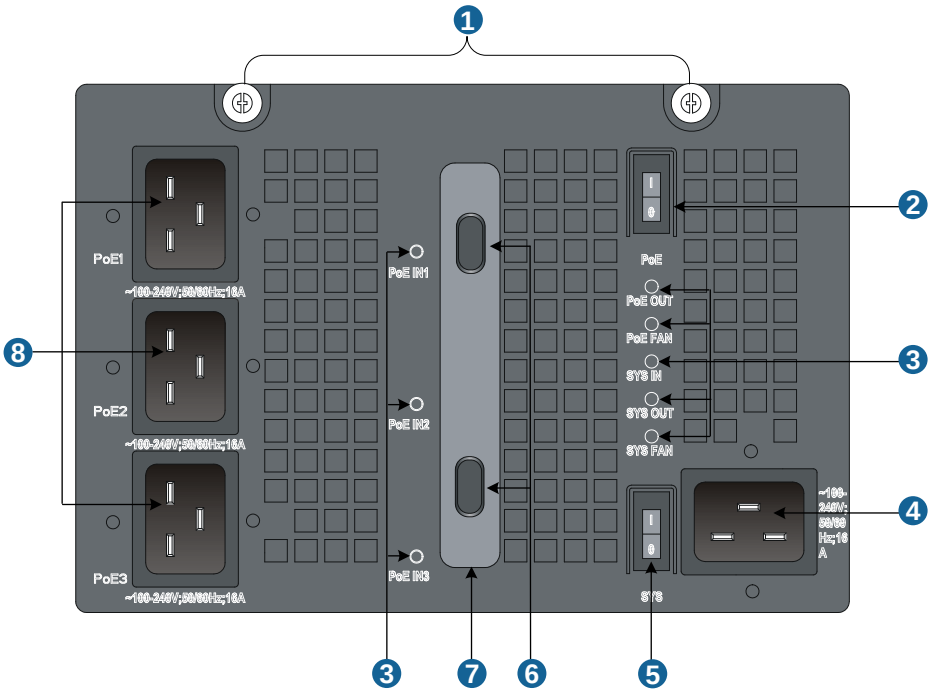


Connecting a 6000W AC power cord

The 6000W AC power supply is a built-in power supply with AC input and DC output. It provides the device with both system power and PoE power, which can be controlled through separate switches. Before connecting power cord, make sure the system power switch PoE power switch both are in the off position.

Each 6000W AC power supply has four independent AC receptacles, where, callout 4 shows the system power receptacle and callout 8 shows the PoE power receptacles (PoE1, PoE2, and PoE3).

Figure 25 Panel view of the 6000W AC



(1) Captive screws	(2) PoE power switch (O for off, and | for on)
(3) Status LEDs	(4) System power receptacle
(5) System power switch (O for off, and | for on)	(6) Holes for fixing cable ties
(7) Power supply handle	(8) PoE power receptacles

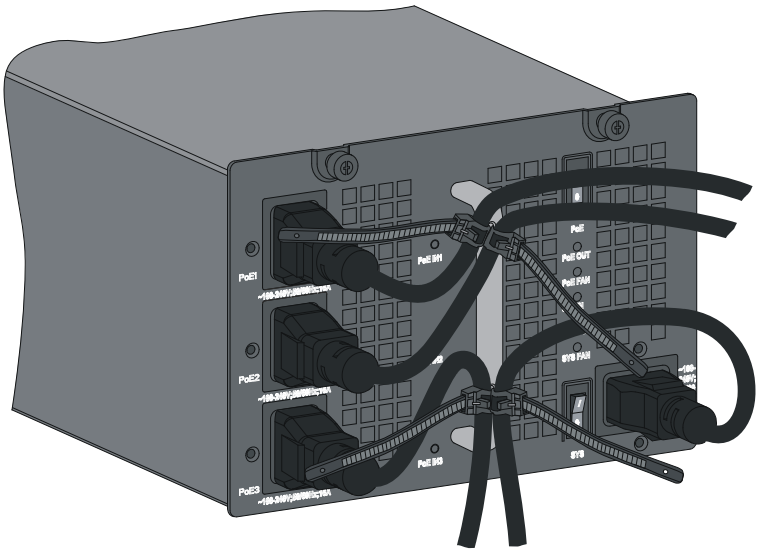
The power cord connection procedures are the same for the system power receptacle and PoE power receptacle of the 6000W AC power supply. This section takes the system power receptacle for example.

To connect an AC power cord to the system power receptacle of the power supply:

1. Make sure of the power cord model (the 6000W AC power supply uses a 16A AC power cord).
2. Plug the power cord into the system power receptacle on the power supply, and ensure a good contact.
3. As shown in Figure 26, secure the power cord to the power supply handle by using a cable tie.
4. Plug the other end of the power cord to the AC power receptacle of the power source.
5. Turn on the power switch.
6. Examine the power supply input status LED.

   If the LED is green, the power cord is correctly connected. If the LED is off or red, examine the installation, and solve the problem. Then switch on the power supply to verify that the LED is green. For description of 6000W AC status LEDs, see "Appendix C LEDs."

Figure 26 Connecting an AC power cord



Connecting the 300W DC/650W DC power cord

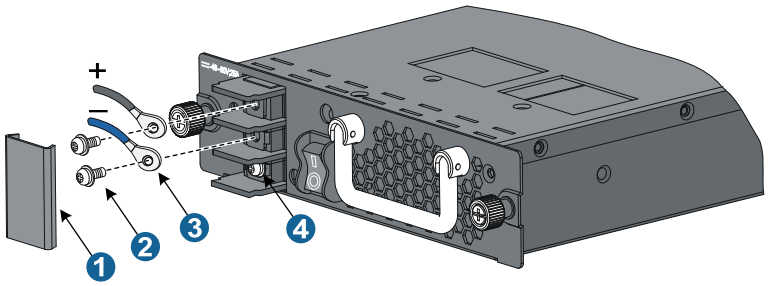
CAUTION:

When connecting the power cord, make sure the circuit breaker is completely turned off for both the positive and negative lines.

To connect the DC power cord:

1. Take off the protection cover.
2. Use a No. 2 Phillips screwdriver to loosen the screws on the wiring terminals.
3. Connect the end of the blue DC power cord marked with – to the negative terminal (–) on the power supply, and fasten the screw.
4. Connect the end of the black DC power cord marked with + to the positive terminal (+) on the power supply, and fasten the screw.
5. Put the protection cover on the wiring terminals.
6. Connect the other ends of the DC power cords to the wiring terminals that provide a power supply to the switch.

Figure 27 Connecting a DC power cord



(1) Protection cover	(2) Screws
(3) Wiring terminal	(4) Grounding point

Connecting the 1400W DC power cord

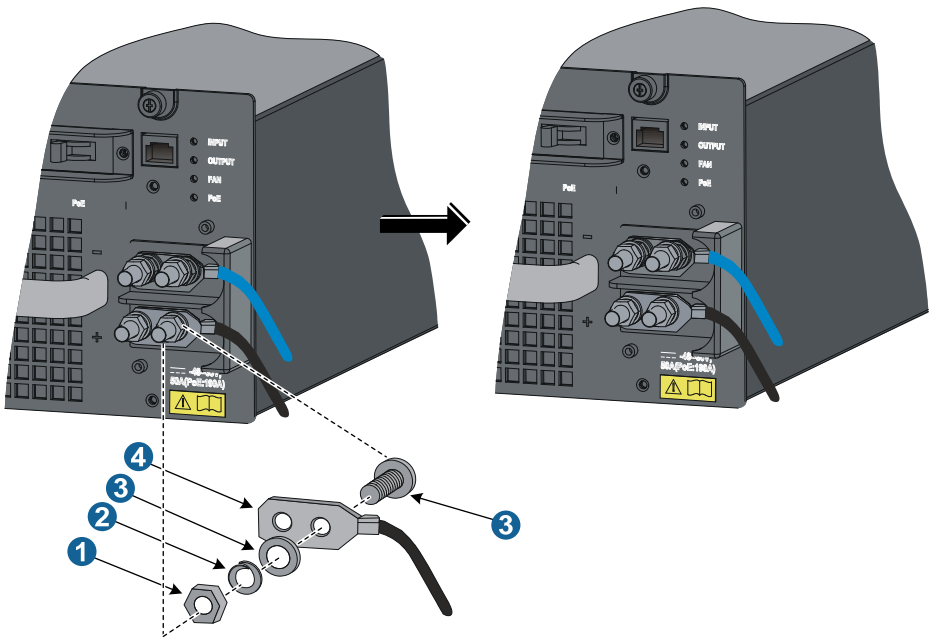
CAUTION:

When connecting the power cord, make sure the circuit breaker is completely turned off for both the positive and negative lines.

To connect the DC power cord:

1. Loosen the captive screws on the protection cover with a Phillips screwdriver and remove the protection cover. There are two flat washers, one spring washer, and one M6 fastening nut from inside to outside on each wiring terminal.
2. Loosen the captive nuts on four wiring terminals with a M6 socket wrench, and remove the captive nut, spring washer, and one flat washer in turn from each wiring terminal.
3. Connect the end of the blue DC power cord marked with – to the negative terminal (–) on the power supply.
4. Connect the end of the black DC power cord marked with + to the positive terminal (+) on the power supply.
5. Put the flat washer and spring washer on the wiring terminal in turn and screw up the captive nut with the M6 socket wrench. Repeat this step for the other three terminals.
6. Put the protection cover on the wiring terminals and faster the captive screws.
7. Connect the other ends of the DC power cords to the wiring terminals that provide a power supply to the switch.

Figure 28 Connecting a DC power cord



(1) M6 screw	(2) Spring washer
(3) Flat washer	(4) Wiring terminal

Setting up a PoE system (optional)

CAUTION:

- If you do not use the PoE function, verify that the PoE power switch on the power supply is off.
- To ensure steady operation of the switch when the switch uses a 1400W DC to supply PoE power, if the total power consumption of the switch (the system power consumption plus the PoE power consumption) is greater than 3300W, use the 1/0 AWG cable (with 53 mm^2 or 0.08 in^2 cross section). HP recommends that you order the HP X210 JG2 to T50 3m DC (2) Power Cables (JG333A). For more information about the cables, see "Appendix B FRUs and compatibility matrixes."
- When the switch uses a 1400W DC to supply PoE power, you can monitor the working status of the external power supply through the PoE power monitoring port. The PoE power monitoring port is an RS-485 compliant port. You can select an RS-485 compliant connection method according to the monitoring port type. When you use a –48 V DC power supply, you do not need to monitor the working status of the external power supply.
- When the switch uses a 6000W AC to supply PoE power, make sure the input voltage for the system power input, PoE 1, PoE 2, and PoE 3 are the same. It can be either 110 VAC or 220 VAC for power supplies of the power supply.

Requirements

Power over Ethernet (PoE) enables a power sourcing equipment (PSE) to supply power to powered devices (PDs) from Ethernet interfaces through twisted pair cables. Commonly used PDs include: IP telephones, wireless LAN access points (APs), and web cameras.

The following PoE types are available:

- **Type 1**—Power delivered by a single port: 0 to 15.4 W; voltage range: 44 V to 57 V; maximum current: 350 mA. This PoE type provides power to classes 0 to 3 PDs.
- **Type 2**—Power delivered by a single port: 0 to 30 W, voltage range: 50 V to 57 V, maximum current: 600 mA. This PoE type provides power to classes 0 to 4 PDs.

To set up a PoE system for the 7500 Switch Series, the following requirements should be met:

Cards supporting PoE

- The 7500 Switch Series can implement the PoE function through the cards listed in Table 9.
- Except the LSQ3GV48SC0 and LSQ1GV48SD0, all the other cards require a PoE dual in-line memory module (DIMM) to implement the PoE function. PoE DIMMs fall into the following types: HP 7500 24-port PoE DIMM(JC671A) and HP 7500 48-port PoE DIMM(JD192B). For the compatibility between the two types of modules and cards, see Table 9. For the installation of a PoE DIMM, see "Installing a PoE DIMM."
- The LSQ1GV48SD0 and LSQ3GV48SC0 each can provide a maximum of 806 W power through PoE. When you use the cards to power devices through PoE, make sure the total power of PDs does not exceed 806 W.

Table 9 Cards supporting PoE

Card model	Number of POE-capable ports	PoE DIMM	PoE type
LSQ1GV48SD0	48	No PoE DIMM needed	Type1, Type2
LSQ3GV48SC0	48		
LSQ1CGV24PSC0	24	HP 7500 24-port PoE DIMM(JC671A)	Type 1
LSQ1GV24PSC0	24		
LSQ1GV24PSA0	24		
LSQ1FV48SA0	48	HP 7500 48-port PoE DIMM(JD192B)	
LSQ1GV48SA0	48		
LSQ1GV48SC0	48		
LSQ1GV40PSC0	40		

Power supplies supporting PoE

- The power supplies 650W AC, 650W DC, 300W AC, and 300W DC for the 7502 and 7503-S do not support PoE. To enable PoE on these switches, use an external PoE power supply (for example, A-RPS800). For how to connect an external PoE power supply, see "Connecting an external PoE power supply."
- To implement PoE on the 7503, 7506, 7506-V, or 7510, you can select power supplies supporting PoE. For description of the power supplies supporting PoE, see Table 10.

Table 10 Power supplies supporting PoE

Power supply model	PoE maximum power output		Separate PoE power cord	Power cord connection procedure
1400W DC	6720 W		No	Connecting the 1400W DC power cord
2800W AC	1150 W (110 V)		Yes	Connecting a 2800W AC power cord
	1400 W (220 V)			
6000W AC	One-line input	1200 W (110 V)	Yes	Connecting a 6000W AC power cord
		1800 W (220 V)		
	Two-line input	2400 W (110 V)		
		3600 W (220 V)		
	Three-line input	3600 W (110 V)		
		5300 W (220 V)		

Installing a PoE DIMM

The PoE DIMM installed on a card can implement the PoE function. It falls into HP 7500 24-port PoE DIMM(JC671A) and HP 7500 48-port PoE DIMM(JD192B).

Installing an HP 7500 24-port PoE DIMM (JC671A)

CAUTION:

- Avoid touching the components on the PoE DIMM and PCB during installation and removal of a PoE DIMM.
- If no PoE DIMM is in place or the module is not fully seated, the interface card cannot supply power, though other functions work well.

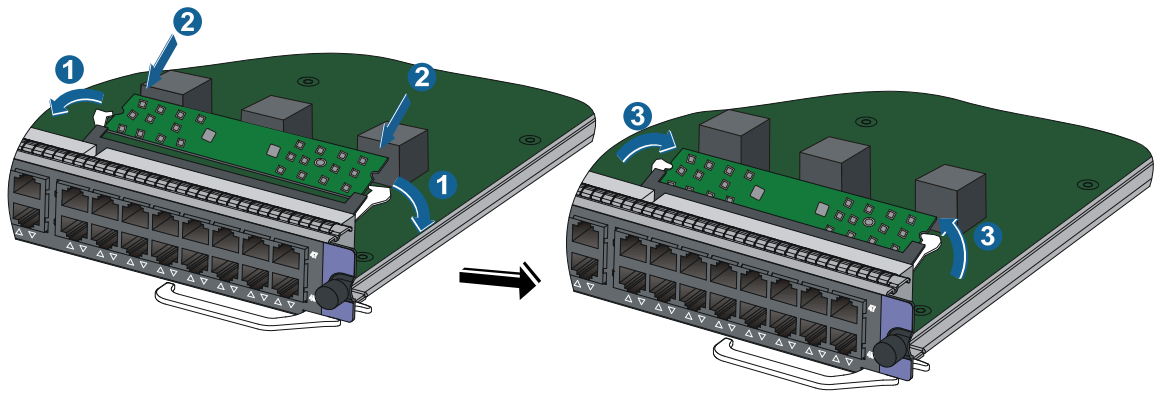
HP 7500 24-port PoE DIMM(JC671A) is applicable to LSQ1CGV24PSC0, LSQ1GV24PSC0, and LSQ1GV24PSA0.

The PoE DIMM slot is a reverse insertion prevention slot to help you identify the direction for installing a PoE DIMM.

To install an HP 7500 24-port PoE DIMM(JC671A):

1. Wear an ESD wrist strap and make sure it makes good skin contact and is well grounded. For more information, see "Attaching an ESD wrist strap."
2. Place the card steadily. Then find the PoE DIMM slot (there is a master mark on the PCB under the slot) on the PCB.
3. Pull the white clips on the two sides of the PoE DIMM slot outward, as shown in callout 1 on Figure 29.
4. Unpack the PoE DIMM, and align the golden finger of the PoE DIMM with the groove on the slot.
5. As shown in Figure 29, use your thumbs to press the edges of the PoE DIMM and push it along the guide rail into the slot until the white clips click into the grooves on the two sides of the PoE DIMM.
6. Verify that the clips lock the PoE DIMM.

Figure 29 Installing a PoE DIMM



(1) Pull the white clips on the two sides of the DIMM outward

(2) Press the edges of the PoE DIMM and push it into the slot along the guide rail

(3) The white clips automatically click into the grooves on the two sides of the DIMM

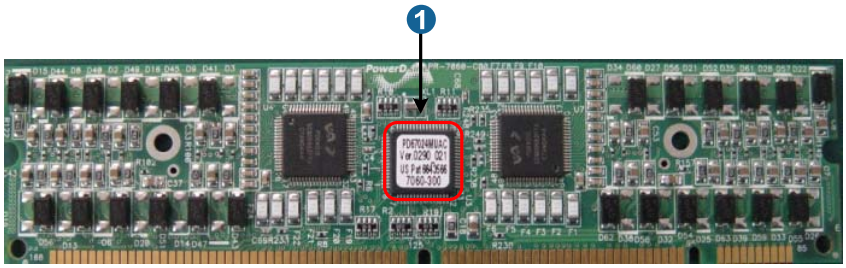
Installing a master/slave DIMM

CAUTION:

- Determine the master or slave HP 7500 48-port PoE DIMM (JD192B) before installation. For how to distinguish them, see Figure 30.
- Plug the master DIMM into the master DIMM slot (there is a "Master" mark on the PCB under the slot), and the slave DIMM into the slave DIMM slot (there is a "Slave" mark on the PCB under the slot).
- The master and slave DIMMs must be used simultaneously. The PoE system operates correctly only when both of them are inserted in the correct slots.
- Avoid touching the components on the PoE DIMM and PCB during installation and removal of a PoE DIMM.

HP 7500 48-port PoE DIMM(JD192B) is applicable to LSQ1FV48SA0, LSQ1GV48SA0, LSQ1GV48SC0, and LSQ1GV40PSC0.

Figure 30 PoE master/slave DIMM



(1) There is a chip on the master DIMM, but not on the slave DIMM.

To install a PoE DIMM:

1. Wear an ESD wrist strap and make sure it makes good skin contact and is well grounded. For more information, see "Attaching an ESD wrist strap."
2. Place the card steadily. Then find the master PoE DIMM slot (there is a Master mark on the PCB under the slot) on the PCB.
3. Pull the white clips on the two sides of the PoE DIMM slot outward, as shown in callout 1 on Figure 29.
4. Unpack the master PoE DIMM, and align the golden finger of the PoE DIMM with the groove on the slot.
5. As shown in Figure 29, use your thumbs to press the edges of the master PoE DIMM and push it along the guide rail into the slot until the white clips click into the grooves on the two sides of the PoE DIMM.
6. Verify that the clips lock the master PoE DIMM.
7. Repeat steps 3 through 6 to install the slave DIMM to the slave DIMM slot (there is a Slave mark on the PCB under the slot).

Connecting an external PoE power supply

CAUTION:

To ensure steady operation of the switch, when you use your own PoE power cord, make sure the cross section of the cable is no less than 8.4 mm^2 (0.01 in^2) and the power cord can carry 50 A current.

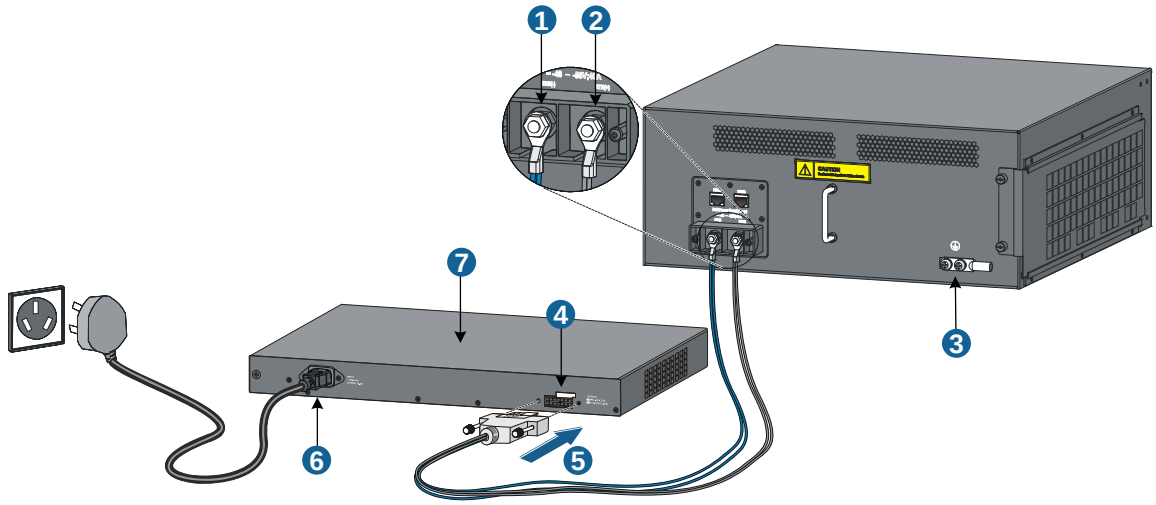
To supply PoE power to 7502 or 7503-S, a PoE power cord is required to connect the external PoE power supply to the PoE input on the chassis rear panel. You can use an A-RPS800 or other DC power supplies that can satisfy PoE input requirements: voltage range –46 V to –57 V (–52 V to –57 V for type 2) and maximum current 40 A, as the external PoE power supply.

If you use an A-RPS800 as the external PoE power supply, HP recommends that you order the HP X290 14-pin Mini-Fit to 2 x OT Copper Lug 1m RPS Power Cable (JG332A). For more information about the cable, see "Appendix B FRUs and compatibility matrixes."

Connecting the A-RPS 800 to the switch

1. Remove the blank panel covering the PoE port of the switch.
2. Connect the OT terminal (with a – sign) on the blue wire to the NEG(–) terminal on the PoE power supply socket, and fasten the captive screw. Connect the OT terminal (with a + sign) on the black wire to the RTN(+) terminal on the PoE power supply socket, and fasten the captive screw.
3. Install the blank panel to the PoE port.
4. Connect the PoE power cord to the A-RPS 800: Plug the H2*7 of the PoE power cord into the DC output of the A-RPS 800, and then fasten the screw, as shown in callout 5 on Figure 31.
5. Supply power to the A-RPS 800: Plug the female end of the AC power cord into the AC input on the A-RPS 800 and ensure a good contact, and plug the male end of the AC power cord into the external power supply socket.

Figure 31 Connecting the A-RPS 800



(1) NEG(–) terminal	(2) RTN(+) terminal
(3) Grounding point	(4) DC output
(5) Insert the H2*7 plug of the PoE power cord into the DC output	(6) AC input
(7) A-RPS 800	

For more information about the A-RPS 800, see *HP A-RPS 800 Redundant Power System User Guide*.

Connecting a user-supplied power cord to the PoE input on the chassis rear panel

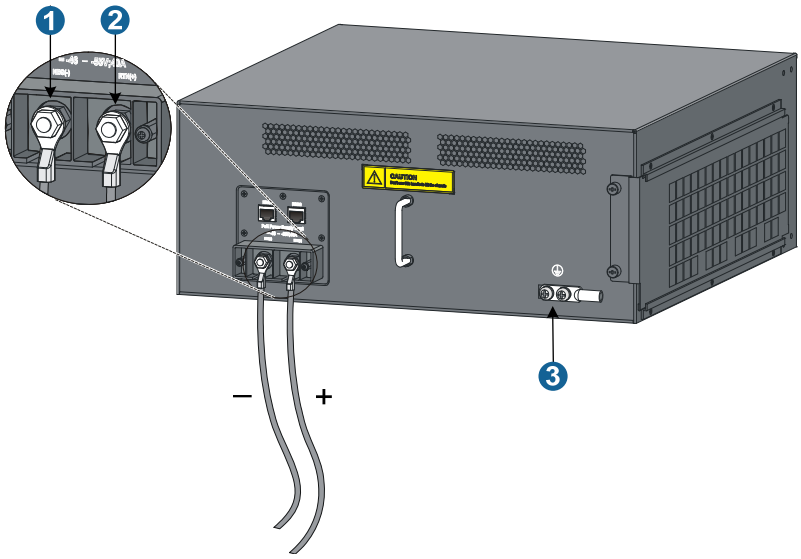
CAUTION:

To avoid damage to the switch, be sure to connect the negative terminals to negative terminals and positive terminals to positive terminals.

To connect a user-supplied power cord to the PoE input on the chassis rear panel:

1. Remove the blank panel covering the PoE port of the switch.
2. Connect the negative OT terminal on the PoE power cord to the NEG(–) terminal on the PoE power supply socket, and fasten the captive screw. Connect the positive OT terminal on the PoE power cord to the RTN(+) terminal on the PoE power supply socket, and fasten the captive screw.
3. Install the blank panel to the PoE port.
4. Connect the PoE power cord to the external PoE power supply.

Figure 32 Connecting a user-supplied power cord



(1) NEG(-) terminal	(2) RTN(+) terminal
(3) Grounding point	

Installing a CF card to an MPU (optional)

If you select an MPU supporting CF card, you can install a CF card as needed.

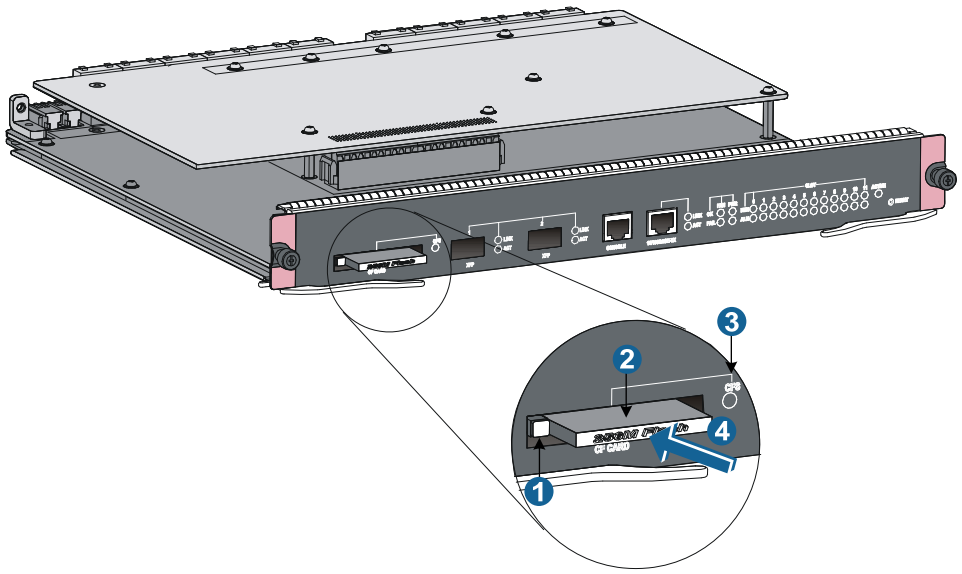
To install a CF card:

1. Push the CF card eject button all the way into the slot, and make sure the button does not project from the panel.
2. Push the CF card all the way into the CF card slot, so that it does not automatically project, as shown in callout 4 of Figure 33. At the same time, the eject button projects.
3. When the switch is powered on, examine the running status of the CF card.

To examine the CF card status, examine the CFS LED on the MPU of the switch. If the LED is on, the CF card is correctly installed. For more information about CFS LED description, see "Appendix C LEDs."

After the switch is powered on, you can examine the CF card running status at the CLI. For more information, see "Hardware management and maintenance."

Figure 33 Installing a CF card



(1) CF card eject button	(2) CF card
(3) CF card status LED	(4) Insert the CF card into the slot

Installing a transceiver module (optional)

CAUTION:

- To avoid component damage, read this section carefully before installing a transceiver module.
- Do not remove the protection cover from a transceiver module before connecting an optical fiber.
- Remove the optical fiber, if any, from a transceiver module before installing it.

The transceiver modules available for the switch include SFP, SFP+, XFP, QSFP+, and CFP.

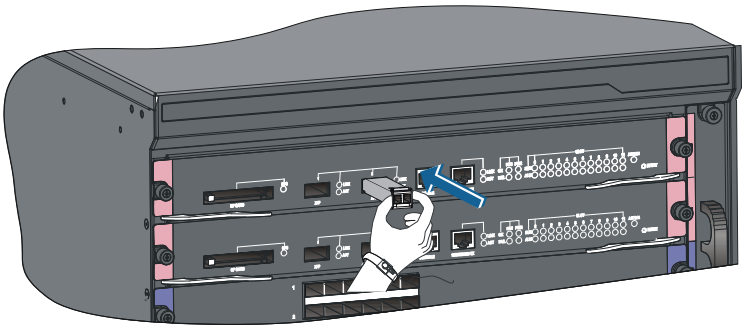
Installing an XFP/SFP+/SFP/QSFP+ transceiver module

1. Wear an ESD wrist strap and make sure it makes good skin contact and is well grounded. For more information, see "Attaching an ESD wrist strap."
2. Unpack the module. Do not touch the golden finger of the module.
3. Pivot the clasp of the module up. Holding the module, gently push the module into the slot until it has firm contact with the slot (when the top and bottom spring tabs catch in the slot), as shown in Figure 34.
   - For a QSFP+ module that uses a plastic pull latch, skip this step. QSFP+ modules use either a metal or plastic pull latch. They are installed in the same way except that you must pivot the clasp up for the module that uses a metal pull latch.

- For an SFP+ module, press the module down against the upward force of the bottom spring tab so you can push the module straight into the port.
- If you cannot hold the module by its two sides because of high module density, press the module on its head end to push it in.

4. Connect the fiber to the module. For the installation procedure, see "Connecting your switch to the network."

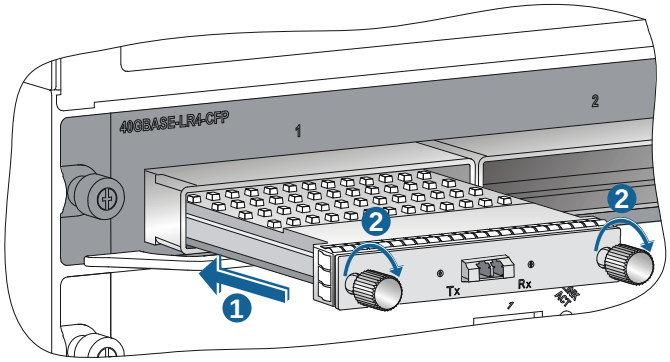
Figure 34 Installing an XFP/SFP+/SFP/QSFP+ module



Installing a CFP module

1. Wear an ESD wrist strap and make sure it makes good skin contact and is well grounded. For more information, see "Attaching an ESD wrist strap."
2. Unpack the CFP module. Do not touch the golden finger of the module.
3. Holding both sides of the module, gently push the module into the slot until it has firm contact with the slot. See Figure 35.
4. Fasten the captive screws.
5. Connect the fiber to the module. For the installation procedure, see "Connecting your switch to the network."

Figure 35 Installing a CFP module



(1) Gently push the module into the slot	(2) Fasten the captive screws

Connecting an SFP+/QSFP+/QSFP+ to SFP+ cable

Use SFP+ cables to connect SFP+ ports, QSFP+ cables to connect QSFP+ ports, and QSFP+ to SFP+ cables to connect QSFP+ and SFP+ ports. All these cables are hot swappable.

To connect an SFP+, QSFP+, or QSFP+ to SFP+ cable:

1. Wear an ESD wrist strap and make sure it makes good skin contact and is well grounded. For more information, see "Attaching an ESD wrist strap."
2. Unpack the cable.
3. Plug the cable connector into the port. Make sure the cable connector is the right side up.

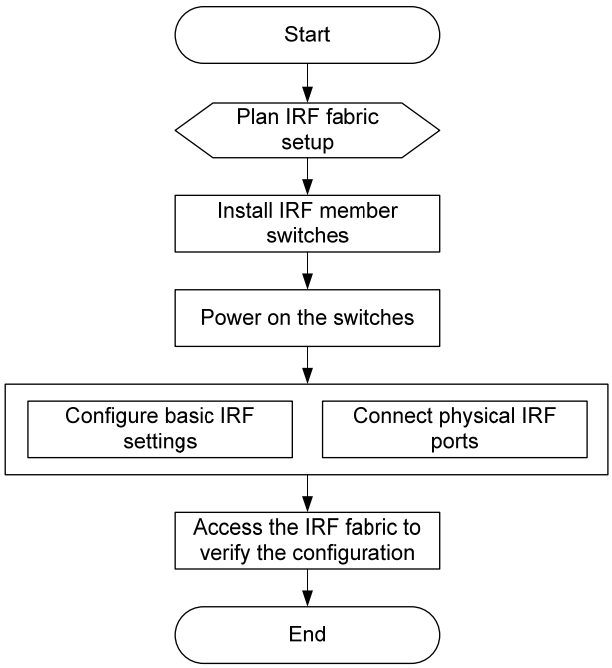
   The bend radius of the cable must be at least eight times the cable diameter.

Setting up an IRF fabric

You can use HP IRF technology to connect and virtualize 7500 switches into a large virtual switch called an "IRF fabric" for flattened network topology, high availability, scalability, and manageability. For more information about IRF, see *HP 7500 Switch Series IRF Configuration Guide*.

IRF fabric setup flowchart

Figure 36 IRF fabric setup flowchart



NOTE:

For the actual procedure, see *HP 7500 Switch Series IRF Configuration Guide* for the software release you are using.

Planning IRF fabric setup

This section describes issues that an IRF fabric setup plan must cover.

Planning IRF fabric size and the installation site

Plan IRF fabric size and the installation site, as follows:

1. Use *HP 7500 Switch Series IRF Configuration Guide* as a reference to identify the number of member switches that your system software version supports for a 7500 IRF fabric.

2. Choose 7500 switch models for your network.

   IRF-capable 7500 switches include the 7503, 7506, 7510, and 7506-V.

   The member switches in a 7500 IRF fabric must be the same model.

3. Select LPUs that can provide 10-GE/40-GE optical ports.

   The 7500 switch series requires 10-GE/40-GE optical ports for IRF connection. Available cards include the LSQ1SRP2XB (JD193B) MPU, and the SC–, SD–, and EB–type LPUs. For more information about the LPUs, see "Appendix B FRUs and compatibility matrixes"

4. Select XFP/SFP+/QSFP+/CFP transceiver modules and fibers for long-haul IRF connection. Select SFP+/QSFP+/QSFP+ to SFP+ cables for short-haul IRF connection.
   For more information about transceiver modules and cables, see "Appendix B FRUs and compatibility matrixes."

5. Plan the installation site.

Identifying the master switch and planning IRF member IDs

Determine which switch you want to use as the master for managing all member switches in the IRF fabric.

An IRF fabric has only one master switch. You configure and manage all member switches in the IRF fabric at the CLI of the master. IRF member switches will automatically elect a master. You can affect the election result by assigning a high member priority to the intended master switch. For more information about master election, see *HP 7500 Switch Series IRF Configuration Guide*.

Prepare an IRF member ID assignment scheme. An IRF fabric uses member IDs to uniquely identify and manage its members, and you must assign each IRF member switch a unique member ID.

Planning IRF topology and connections

Connect the IRF member switches through IRF ports, the logical interfaces for the connections between IRF member switches. Each IRF member switch has two IRF ports: IRF-port 1 and IRF-port 2. To use an IRF port, you must bind at least one physical port to it.

When connecting two neighboring IRF member switches, you must connect the physical ports of IRF-port 1 on one switch to the physical ports of IRF-port 2 on the other switch.

A two-member IRF fabric must use the daisy chain topology.

If the system software version you are using supports more than two IRF members, you can create an IRF fabric that comprises more than two members in daisy chain topology, or more reliably, ring topology. In ring topology, the failure of one IRF link does not cause the IRF fabric to split as in daisy chain topology. Rather, the IRF fabric changes to a daisy chain topology without interrupting network services.

Identifying physical IRF ports on the member switches

Identify the physical IRF ports on the member switches according to your topology and connection scheme.

On 7500 switches, only 10-GE/40-GE ports can be used for IRF connection.

The 7500 switches support multi-card link aggregation for IRF ports. You can bind up to eight physical ports to one IRF port.

Installing IRF member switches

Step		Reference
1.	Prepare the installation site	Preparing for installation
2.	Rack mount the IRF member switches to racks	Installing the switch
3.	Install modules on IRF member switches	Installing FRUs

Configuring basic IRF settings

CAUTION:

If one or two LSQ1SRP2XB MPUs are used, the switch automatically creates one virtual LPU slot for each MPU slot, and the LPU slot numbers are higher than the largest physical LPU slot number. To bind the XFP ports on one MPU to an IRF port, you must access the virtual LPU for the MPU. You can use the **display device** command to display information about the virtual LPU slots.

After you install the IRF member switches, power on the switches, and log in to each IRF member switch (see "Connecting your switch to the network") to configure their member IDs, member priorities, and IRF port bindings.

Follow these guidelines when you configure the switches:

- You must first configure the member IDs, member priorities, and IRF port bindings for the IRF member switches, save the configuration, connect the member switches, and change the operating mode of the switches to IRF mode.
- Assign the master switch higher member priority than any other switch.
- Bind physical ports to IRF port 1 on one switch and to IRF port 2 on the other switch.
- Execute the **display irf configuration** command to verify the basic IRF settings.

For more information about configuring basic IRF settings, see *HP 7500 Switch Series IRF Configuration Guide*.

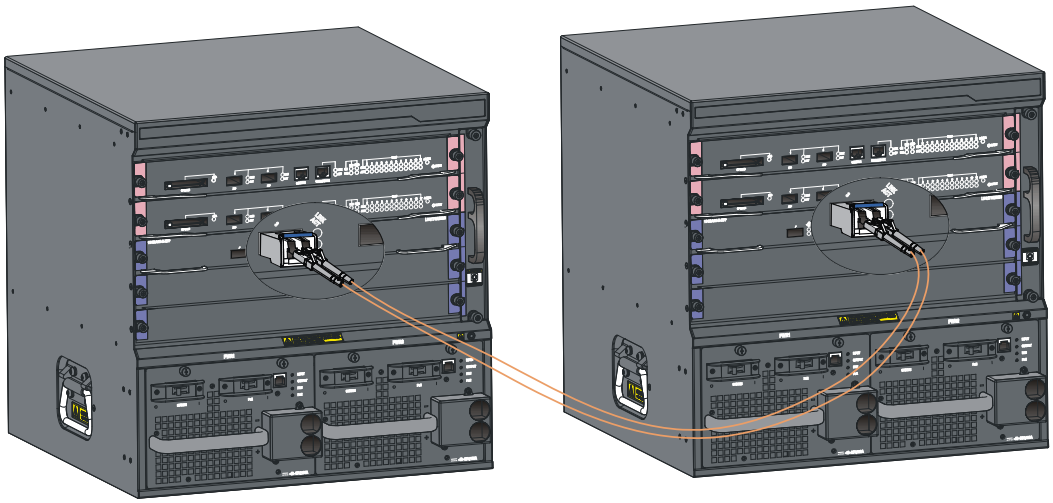
Connecting the physical IRF ports

Connect the physical IRF ports of switches by following these guidelines.

- Use XFP transceiver modules and fibers to connect 10-Gigabit XFP ports.
- You can use SFP+ transceiver modules and fibers, or use SFP+ cables to connect SFP+ ports. SFP+ cables are used over a relatively short distance.
- Use CFP transceiver modules and fibers to connect CFP ports.
- When connecting XFP/SFP+/CFP ports, connect the transmit port of an XFP/SFP+/CFP transceiver module at one end to the receive port of an XFP/SFP+/CFP transceiver module at the other end.
- Use QSFP+ transceiver modules and fibers for long-haul connection, or use QSFP+ cables to connect QSFP+ ports for short-haul connection.
- The transceiver modules at the two ends of an IRF link must be the same type.

For more information about installing transceiver modules, see "Installing FRUs." For more information about connecting fibers, see "Connecting your switch to the network."

Figure 37 Connecting two IRF member switches



Verifying the IRF fabric configuration

After you finish configuring basic IRF settings and connecting IRF ports, verify the basic functionality of the IRF fabric, as follows:

1. Log in to the IRF fabric through the console port of any member switch.
2. Create a Layer 3 interface, assign it an IP address, and make sure the IRF fabric and the remote network management station can reach each other.
3. Use Telnet or SNMP to access the IRF fabric from the network management station. (See *HP 7500 Switch Series Fundamentals Configuration Guide*.)
4. Verify that you can manage all member switches as if they were one node.
5. Display the running status of the IRF fabric by using the commands in Table 11.

Table 11 Displaying and maintaining IRF configuration and running status

Task	Command
Display information about the IRF fabric	**display irf**
Display topology information about the IRF fabric	**display irf topology**

NOTE:

To avoid IP address collision and network problems, configure at least one MAD mechanism to detect the presence of multiple identical IRF fabrics and handle collisions. For more information about MAD, see *HP 7500 Switch Series IRF Configuration Guide.*

Connecting your switch to the network

This chapter describes how to connect your switch to a network.

The first time you access a switch you must log in through the console port. On the switch, you can configure Telnet or SSH for remote access through Ethernet ports. You manage console login users at AUX user interfaces, and manage Telnet and SSH users at VTY user interfaces. For more information about login methods and user interfaces, see *HP 7500 Switch Series Fundamentals Configuration Guide*.

NOTE:

- A 7500 switch with one MPU supports one AUX user and a 7500 switch with two MPUs supports up to two concurrent AUX users. The total number of AUX users that an IRF fabric supports equals the number of MPUs in the IRF fabric.
- All 7500 switches support up to 16 concurrent VTY users.

Accessing the switch for the first time

The first time you access the switch you must use a console cable to connect a console terminal, for example, a PC, to the console port on the switch.

Setting up the configuration environment

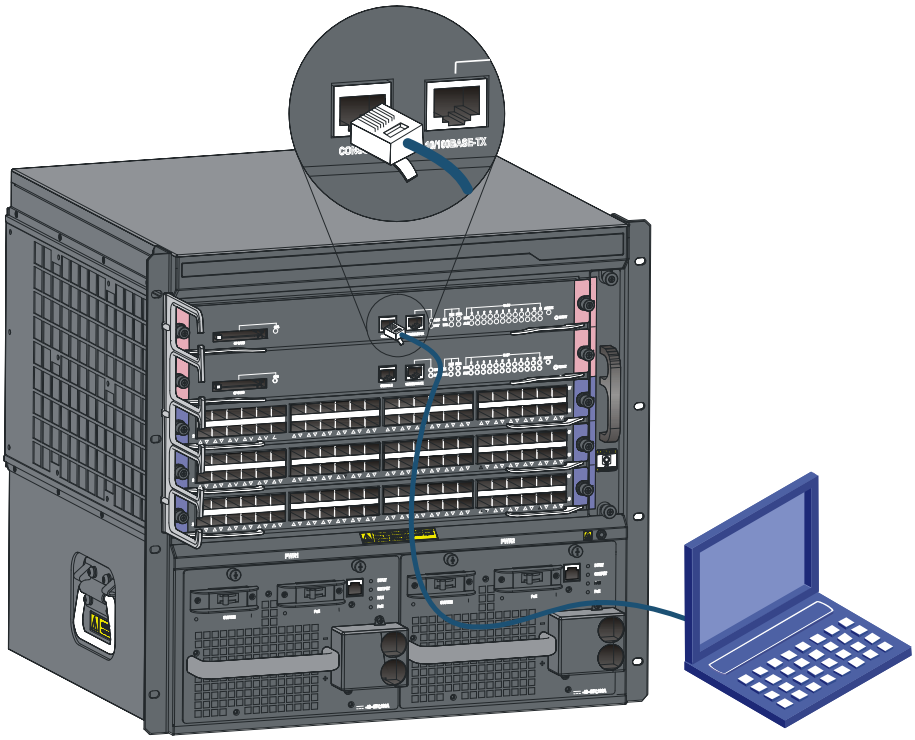
To connect a terminal (for example, a PC) to the switch:

1. Plug the DB-9 female connector of the console cable to the serial port of the PC on which you configure the switch.
2. Plug the RJ-45 connector of the console cable to the console port of the switch.

NOTE:

- Identify the mark on the console port and make sure you are connecting to the correct port.
- The serial ports on PCs do not support hot swapping. If the switch has been powered on, connect the console cable to the PC before connecting to the switch, and when you disconnect the cable, first disconnect from the switch.

Figure 38 Setting up the environment for local login



Setting terminal parameters

To configure and manage the switch, you must run a terminal emulator program on the console terminal.

If your PC runs Windows Server 2003, add the HyperTerminal component before performing the following steps to log in to and manage the switch. If your PC runs Windows Server 2008, Windows 7, Windows Vista, or any other operating system, prepare third-party terminal control software, and follow the software user guide or help to configure the terminal.

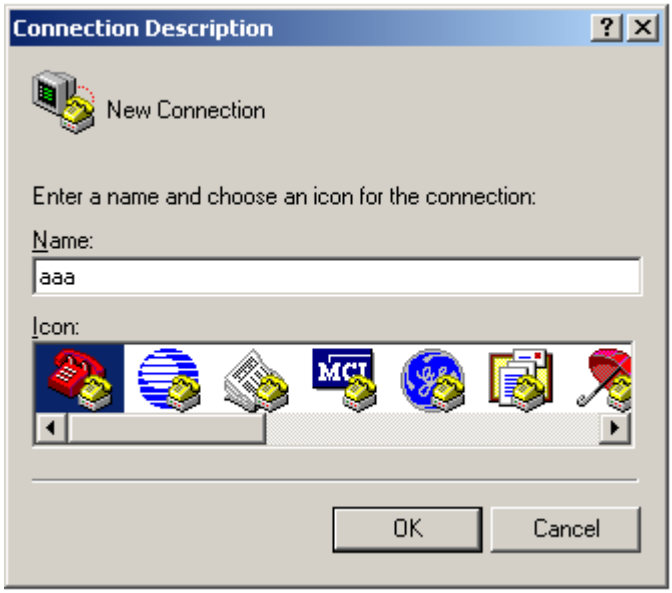
The following are the required terminal settings:

- **Bits per second**—9,600
- **Data bits**—8
- **Parity**—None
- **Stop bits**—1
- **Flow control**—None
- **Emulation**—VT100

To set terminal parameters, for example, on a Windows XP HyperTerminal:

1. Select **Start** > **All Programs** > **Accessories** > **Communications** > **HyperTerminal**.
   The **Connection Description** dialog box appears.
2. Enter the name of the new connection in the **Name** field and click **OK**.

Figure 39 Connection description

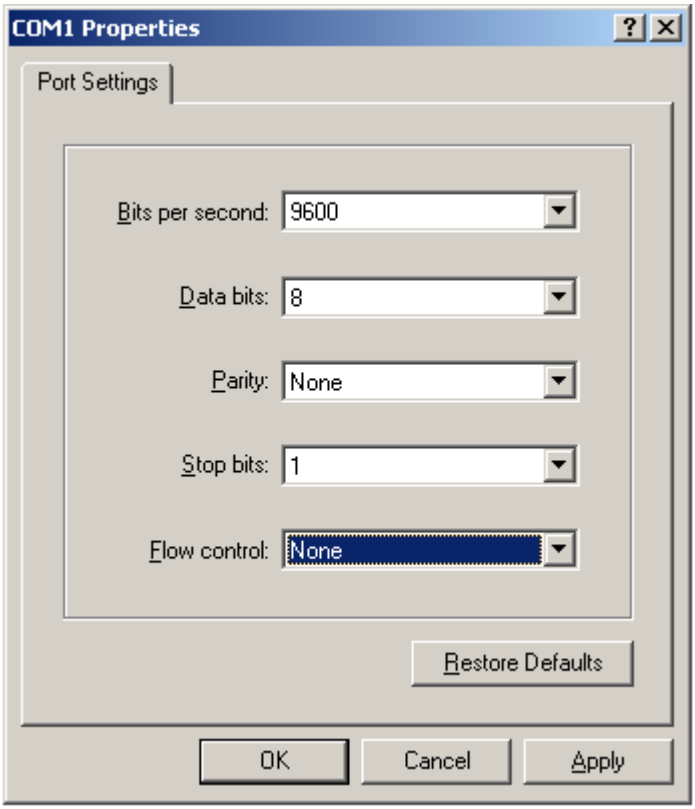


3. Select the serial port to be used from the **Connect using** list, and click **OK**.

Figure 40 Selecting the serial port used by the HyperTerminal connection

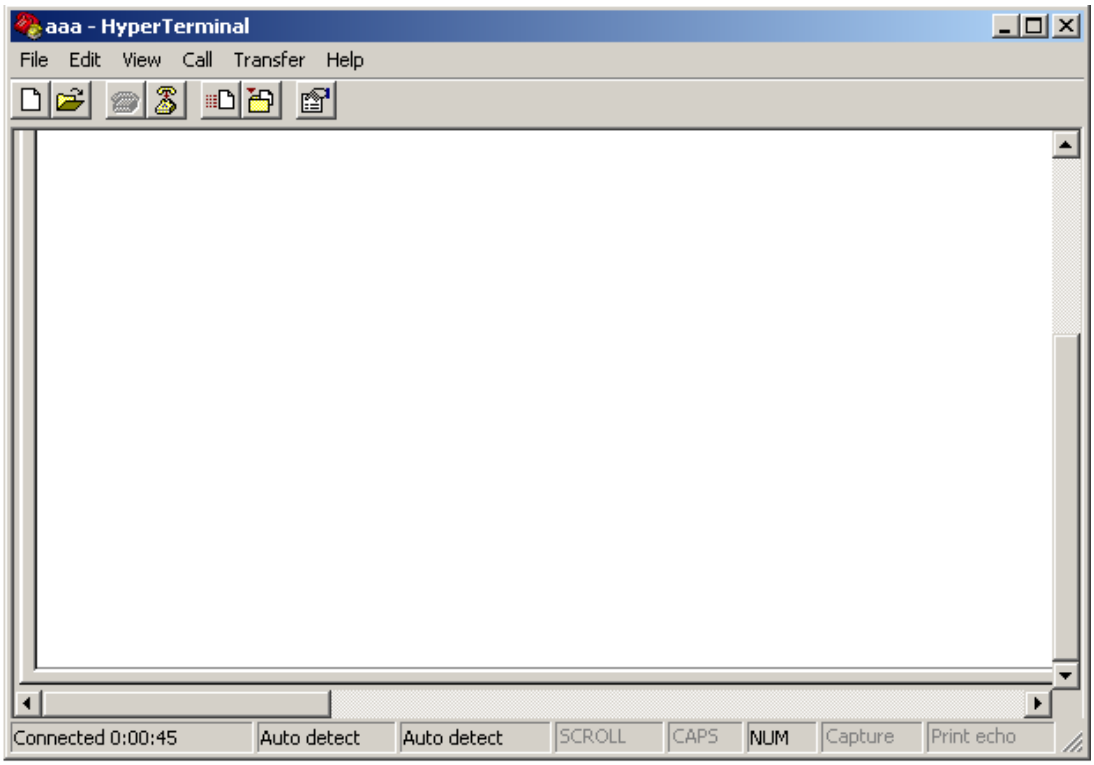
4. Set **Bits per second** to **9600**, **Data bits** to **8**, **Parity** to **None**, **Stop bits** to **1**, and **Flow control** to **None**, and click **OK**.

Figure 41 Setting the serial port parameters



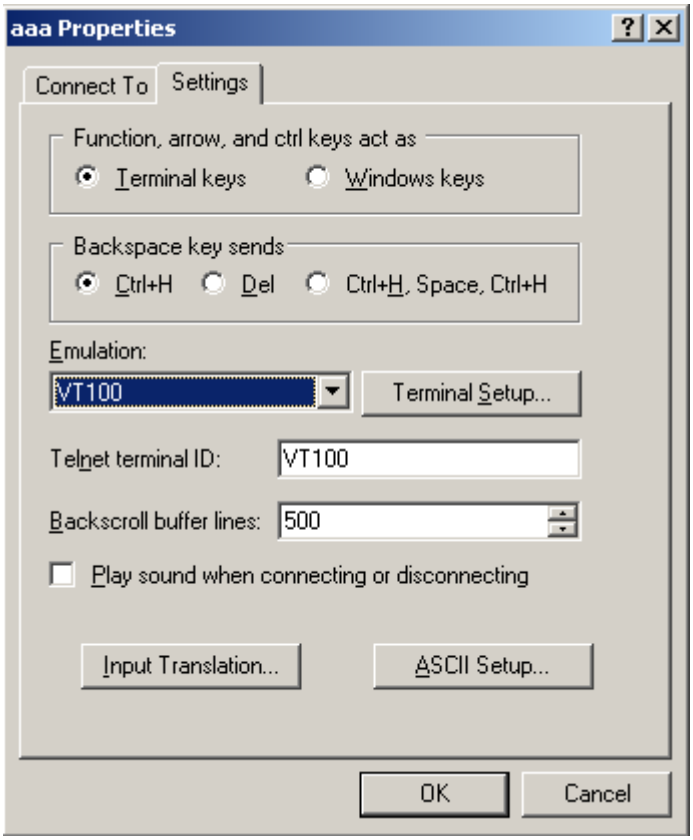
5. Select **File** > **Properties** in the HyperTerminal window.

Figure 42 HyperTerminal window



6. On the **Settings** tab, set the emulation to **VT100** and click **OK**.

Figure 43 Setting terminal emulation in Switch Properties dialog box



Powering on the switch

Before powering on the switch, confirm the following:

- You know where the power switch of the equipment room is located.
- The switch has been steadily mounted.
- All the cards have been correctly installed.
- All the communication cables, fibers, power cords, and grounding cables have been correctly connected.
- The voltage of power supply can meet the requirements of the switch.
- The console cable has been correctly connected. The configuration terminal has been started, and the terminal parameters have been configured.

To power on the switch:

Turn on the power source of the switch to power on the switch.

The following is a sample output you can see on the terminal:

```
Starting......
RAMLine.....OK
System is booting...............
    ********************************************************************
    *                                                                  *
```

```
*                     BOOTROM, Version 3.01                      *
*                                                                *
******************************************************************
Creation Date       : Aug 26 2010
CPU Type            : BCM1125H
CPU L1 Cache        : 32KB
CPU Clock Speed     : 600MHz
Memory Type         : DDR SDRAM
Memory Size         : 512MB
Memory Speed        : 133MHz
BootRom Size        : 512KB
Flash Size          : 64MB
CPLD Version        : 002
PCB Version         : Ver.B
Mac Address         : 0000FC007506

Press Ctrl+B to enter Boot Menu...0
Starting to get the main application file--flash:/7500.app!.....
........................................
The main application file is self-decompressing.............................
.....................................................................
.............done!OK
System is starting...
User interface aux0 is available.

Press ENTER to get started.
```

Press **Enter** at the prompt. When the prompt <Sysname> appears, you can configure the switch. For more information about configuring the switch, see "Configuring the switch."

After powering on the switch, verify the following items:

- The cooling system is working, and you can hear fan rotating noise and feel air being blown out.
- The system status LEDs on the MPUs show that the system is operating normally. For more information about LED behaviors, see "Appendix C LEDs."

Configuring the switch

By default, the switch does not authenticate the console login user at an AUX interface. To increase system security and enable remote management:

- Configure remote access services, for example, Telnet or SSH.
- Configure authentication on each user interface, including the AUX interfaces.

Configuring authentication on a user interface

You can configure authentication on a user interface to control access to the switch.

Table 12 describes the Telnet login authentication methods available for a VTY user interface.

Table 12 Telnet login authentication methods

Authentication method	Feature	Application scenarios
None	Easy to configure, allows any user to Telnet to your switch, and lowest in security	Lab environments and extremely secure network environments
Password	Easy to configure, allows any user knowing the password to telnet to your switch, high in security, but incapable of assigning different privilege levels to different users	Environments that do not need granular privilege management
Username and password	Complex to configure, allows users inputting the correct username and password to Telnet to your switch, high in security, and capable of assigning different privilege levels to different users	Environments where multiple operators cooperate to manage the switch

For more information about login methods, see *HP 7500 Switch Series Fundamentals Configuration Guide*.

Configuring the basic access function

A 7500 switch without any configuration can perform basic data forwarding immediately after it is plugged into a network. To implement more forwarding features, configure the basic network settings in Table 13 on the switch.

Table 13 Basic network settings

Function	Description
IP addresses	Enables remote switch management, for example, by using Telnet.
Static routes	Implement static routing.
VLANs	Divide the LAN into multiple VLANs for data security.
MSTP	Avoids loops in a dual-homed network.

Configuration example

Configuring Telnet service

Enter system view.

```
<Sysname> system-view
```

Enable the Telnet server.

```
[Sysname] telnet server enable
```

Enter user interface view of VTY 0.

```
[Sysname] user-interface vty 0
```

Configure the authentication mode as password for users logging in through user interface VTY 0.

```
[Sysname-ui-vty0] authentication-mode password
```

Configure the password as **hello** for users logging in through user interface VTY 0.

```
[Sysname-ui-vty0] set authentication password cipher hello
```

Set the user privilege level to 3 for the users that log in through user interface VTY 0. Then, all users that log in through Telnet can use all commands.

```
[Sysname-ui-vty0] user privilege level 3
[Sysname-ui-vty0] quit
```

Configuring the basic network settings

- Configure IP addresses.

  # Create VLAN-interface 1.

  ```
  [Sysname] interface vlan-interface 1
  ```

  # Assign an IP address to VLAN-interface 1 according to the IP network segment distribution and usage in the current network. 192.168.0.1 is used as an example.

  ```
  [Sysname-Vlan-interface1] ip address 192.168.0.1 24
  [Sysname-Vlan-interface1] quit
  ```

- Configure static routes

  # Configure a static route, with the destination IP address 172.16.1.0 and the next hop IP address 192.168.0.2.

  ```
  [Sysname] ip route-static 172.16.1.0 255.255.255.0 192.168.0.2
  ```

- Configure VLANs

  # Create VLAN 10, and enter its view.

  ```
  [Sysname] vlan 10
  [Sysname-vlan10]
  ```

  # Assign port GigabitEthernet 2/0/1 to VLAN 10.

  ```
  [Sysname-vlan10] port gigabitethernet 2/0/1
  [Sysname-vlan10] quit
  ```

- Configure MSTP

  # Create an MST region named **example**, map VLAN 10 to instance 1, and set the MSTP revision level to 0.

  ```
  [Sysname] stp region-configuration
  [Sysname-mst-region] region-name example
  [Sysname-mst-region] instance 1 vlan 10
  [Sysname-mst-region] revision-level 0
  ```

  # Activate the MST region configuration.

  ```
  [Sysname-mst-region] active region-configuration
  [Sysname-mst-region] quit
  ```

  # Configure the switch as the primary root bridge of instance 1.

  ```
  [Sysname] stp instance 1 root primary
  ```

  # Enable MSTP globally.

  ```
  [Sysname] stp enable
  ```

For more information about the access function configuration, see *HP 7500 Switch Series Layer 2—LAN Switching Configuration Guide*.

Verifying the network configuration

To verify the software version and network configuration, perform **display** commands in any view.

Task	Command
Display the name, model, and running operating system version of the switch.	**display version**
Display the current configuration of the switch.	**display current-configuration**
Display the interface status and configuration.	**display interface brief**
Display the IP configuration information of the specified or all Layer 3 interfaces.	**display ip interface brief**
Display information about active routes in the routing table.	**display ip routing-table**
Display VLAN information.	**display vlan**
Display the spanning tree status and statistics.	**display stp brief**
Display Neighbor Discovery Protocol (NDP) configuration information.	**display ndp**

Connecting the switch to the network

Before you connect the switch to the network, verify that all its basic settings are correct.

Connecting your switch to the network through twisted pair cables

The 10/100Base-TX and 1000Base-T ports of the HP 7500 Switch Series use RJ-45 connectors and support MDI/MDI-X auto-sensing. Use category-5 or better twisted pair cables to connect the Ethernet ports of your switch to the network.

To connect your switch to the network through twisted pair cables:

1. Plug one end of the twisted pair cable into the RJ-45 Ethernet port of your switch.
2. Plug the other end of the twisted pair cable into the RJ-45 Ethernet port of the access device in the network.
3. Verify that the LEDs of the RJ-45 Ethernet port are normal.

   For more information about the LED status, see "Appendix C LEDs."

Connecting your switch to the network through optical fibers

⚠ WARNING!

To avoid injury to your eyes, do not stare at the fiber interfaces when connecting optical fibers.

You can install a transceiver module (see "Installing FRUs") in a fiber port and use optical fibers to connect the port to the network. For more information about the optical fibers, see "Appendix D Cables."

The installation of different optical fiber connectors is similar.

To connect your switch to the network through optical fibers:

1. Install a transceiver module into the port.
2. Remove the dust cover of the optical fiber connector, and clean the end of the optical fiber.

3. Remove the dust plug of the transceiver module, plug one end of the optical fiber into the transceiver module in the switch, and plug the other end into the transceiver module in the peer device.
   - For how to connect an LC connector, see Figure 44.
   - For how to connect an MPO connector, see Figure 45.
4. Examine the port LEDs for incorrect connection.

   For more information about the LED status, see "Appendix C LEDs."

NOTE:

For the QSFP+ module, you do not need to differentiate between the transmitter (TX) and receiver (RX) ports. For other types of transceiver modules, the Tx port on one end must connect to the RX port on the other end.

Figure 44 Using an LC optical fiber connector to connect an SFP module

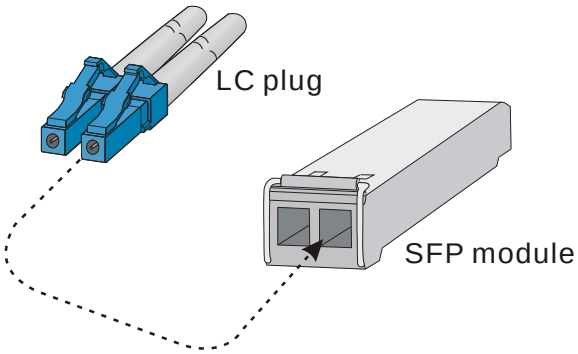
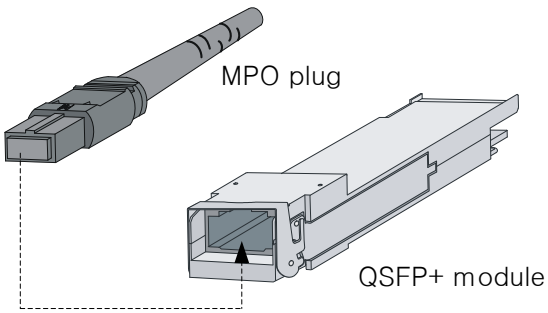


Figure 45 Using an MPO optical fiber connector to connect a QSFP+ module



Testing connectivity

After you plug the switch into the network, use the **ping** or **tracert** command to test the network connectivity. For more information about these commands, see *HP 7500 Switch Series Command References*.

Hardware management and maintenance

NOTE:

The command output depends on your software version.

Displaying information about the switch

Displaying software and hardware version information

You can use the **display version** command to display the switch software and hardware version information, including the version of the running software and hardware, uptime of the switch, and type and uptime of each MPU and LPU. The output of the **display version** command depends on your switch model and software and hardware versions.

```
<Sysname> display version
HP Comware Platform Software
Comware Software, Version 5.20.99, Release 6620
Copyright (c) 2010-2011 Hewlett-Packard Development Company, L.P.
HP 7503 uptime is 0 week, 0 day, 6 hours, 57 minutes

MPU(M) 0:
Uptime is 0 weeks,0 days,6 hours,57 minutes
HP 7503 MPU(M) with 1 BCM1125H Processor
BOARD TYPE:         LSQ1SRP2XB
DRAM:               512M bytes
FLASH:              64M bytes
NVRAM:              512K bytes
PCB 1 Version:      VER.B
PCB 2 Version:      VER.B
Bootrom Version:    301
CPLD 1 Version:     006
CPLD 2 Version:     006
Release Version:    HP 7503-6620
Patch Version  :    None

MPU(S) 1:
Uptime is 0 weeks,0 days,1 hours,23 minutes
HP 7503 MPU(S) with 1 BCM1125H Processor
BOARD TYPE:         LSQ1SRP2XB
DRAM:               512M bytes
FLASH:              64M bytes
NVRAM:              512K bytes
PCB 1 Version:      VER.B
PCB 2 Version:      VER.B
```

```
Bootrom Version:    301
CPLD 1 Version:     006
CPLD 2 Version:     006
Release Version:    HP 7503-6620
Patch Version  :    None

LPU 2:
Uptime is 0 weeks,0 days,6 hours,55 minutes
HP 7503 LPU with 1 BCM1122 Processor
BOARD TYPE:         LSQ1GV48SA
DRAM:               512M bytes
FLASH:              0M bytes
NVRAM:              0K bytes
PCB 1 Version:      VER.C
Bootrom Version:    205
CPLD 1 Version:     003
Release Version:    HP 7503-6620
Patch Version  :    None

Slot 3 Without Board

LPU 4:
Uptime is 0 weeks,0 days,6 hours,56 minutes
HP 7503 LPU with 1 BCM1122 Processor
BOARD TYPE:         LSQ1FV48SA
DRAM:               256M bytes
FLASH:              0M bytes
NVRAM:              0K bytes
PCB 1 Version:      VER.C
Bootrom Version:    205
CPLD 1 Version:     004
Release Version:    HP 7503-6620
Patch Version  :    None

LPU 5:
Uptime is 0 weeks,0 days,6 hours,56 minutes
HP 7503 LPU with 1 BCM1122 Processor
BOARD TYPE:         SRP2XBSLAVE
DRAM:               512M bytes
FLASH:              0M bytes
NVRAM:              0K bytes
PCB 1 Version:      NA
Bootrom Version:    205
CPLD 1 Version:     NA
Release Version:    HP 7503-6620
Patch Version  :    None

LPU 6:
```

```
Uptime is 0 weeks,0 days,1 hours,25 minutes
HP 7503 LPU with 1 BCM1122 Processor
BOARD TYPE:          SRP2XBSLAVE
DRAM:                512M bytes
FLASH:               0M bytes
NVRAM:               0K bytes
PCB 1 Version:       NA
Bootrom Version:     205
CPLD 1 Version:      NA
Release Version:     HP 7503-6620
Patch Version  :     None
```

Table 14 Command output

Field	Description
HP Comware Platform Software	The software platform of the switch
Comware Software, Version 5.20.99, Release 6620	Software version, which comprises software platform name (Comware), platform version (Version 5.20.99), and product release version (Release 6620)
HP 7503 uptime is 0 week, 0 day, 6 hours, 57 minutes	Displays how long the switch has been running since the last reboot
MPU(M) 1 LPU x	Card type and card slot: • **MPU(M)**—Active MPU • **MPU(S)**—Standby MPU • **LPU**—Line processing unit
Uptime is 0 weeks,0 days,1 hours,23 minutes	Displays how long the card has been running since the last reboot
HP 7503 MPU(M) with 1 BCM1125H Processor	CPU type of the card
BOARD TYPE	Card model
DRAM	Memory size of the card
FLASH	Flash size of the card
NVRAM	Nonvolatile random-access memory (NVRAM) size of the card
PCB 1 Version	Version of PCB 1 on the card
Bootrom Version	Boot ROM version of the card
CPLD 1 Version	Complex programmable logical device (CPLD) 1 version of the card
Release Version	Software version of the card
Patch Version	Patch version of the card

Displaying switch running information

For diagnosis or troubleshooting, you can use separate **display** commands to collect running status data module by module or use the **display diagnostic-information** command to bulk collect running data for

multiple modules. Executing the **display diagnostic-information** command is equivalent to executing the **display clock**, **display version**, **display device**, and **display current-configuration** commands in turn.

- Save running status data for multiple feature modules.

```
<Sysname> display diagnostic-information
Save or display diagnostic information (Y=save, N=display)? [Y/N]:y
Please input the file name(*.diag)[flash:/default.diag]:aa.diag
Diagnostic information is outputting to flash:/aa.diag.
Please wait...
Save succeeded.
```

  To view the content of file **aa.diag**, execute the **more.aa.diag** command in user view, in combination of the **Page Up** and **Page Down** keys.

- Display running status data for multiple feature modules. (The output depends on your device model.)

```
<Sysname> display diagnostic-information
Save or display diagnostic information (Y=save, N=display)? [Y/N]:n
================================================
  ==============display clock==============
================================================
08:54:16 UTC Fri 11/15/2010
================================================
  ==============display version==============
================================================
```

  …Omitted…

Displaying detailed information about a card

- Use the **display device verbose** command to display detailed information about all cards in the switch.

```
<Sysname> display device verbose
Slot No. Brd Type         Brd Status     Subslot Num    Sft Ver         Patch Ver
 0       LSQ1SRP2XB       Master         0              7500-6620       None
 1       LSQ1SRP2XB       Slave          0              7500-6620       None
 2       LSQ1GV48SA       Normal         0              7500-6620       None
 3       NONE             Absent         0              NONE             None
 4       LSQ1FV48SA       Normal         0              7500-6620       None
 5       SRP2XBSLAVE      Normal         0              7500-6620       None
 6       SRP2XBSLAVE      Normal         0              7500-6620       None

Slot  0 info:
Status          :   Master
Type            :   LSQ1SRP2XB
Software Ver    :   7500-6620
PCB 1 Ver       :   VER.B
PCB 2 Ver       :   VER.B
FPGA Ver        :   001
BootRom Ver     :   301
CPLD 1 Ver      :   006
```

```
CPLD 2 Ver     :   006

Slot  1 info:
Status         :   Slave
Type           :   LSQ1SRP2XB
Software Ver   :   7500-6620
PCB 1 Ver      :   VER.B
PCB 2 Ver      :   VER.B
FPGA Ver       :   001
BootRom Ver    :   301
CPLD 1 Ver     :   006
CPLD 2 Ver     :   006

Slot  2 info:
Status         :   Normal
Type           :   LSQ1GV48SA
Software Ver   :   7500-6620
PCB 1 Ver      :   VER.C
FPGA Ver       :   001
BootRom Ver    :   205
CPLD 1 Ver     :   003
Chip           :   0
  Learning Mode:   IVL
Chip           :   1
  Learning Mode:   IVL

Slot  4 info:
Status         :   Normal
Type           :   LSQ1FV48SA
Software Ver   :   7500-6620
PCB 1 Ver      :   VER.C
FPGA Ver       :   001
BootRom Ver    :   205
CPLD 1 Ver     :   004
Chip           :   0
  Learning Mode:   IVL
Chip           :   1
Learning Mode:   IVL

Slot  5 info:
Status         :   Normal
Type           :   SRP2XBSLAVE
Software Ver   :   7500-6620
PCB 1 Ver      :   VER.0
FPGA Ver       :   001
BootRom Ver    :   205
CPLD 1 Ver     :   006
Chip           :   0
```

```
  Learning Mode:   IVL

Slot  6 info:
Status         :   Normal
Type           :   SRP2XBSLAVE
Software Ver   :   7500-6620
PCB 1 Ver      :   VER.0
FPGA Ver       :   001
BootRom Ver    :   205
CPLD 1 Ver     :   006
Chip           :   0
  Learning Mode:   IVL
```

- Use the **display device slot** *slot-number* command to display detailed information about a card.

```
<Sysname> display device slot 0
Slot  0 info:
Status         :   Master
Type           :   LSQ1SRP2XB
Software Ver   :   7500-6620
PCB 1 Ver      :   VER.B
PCB 2 Ver      :   VER.B
FPGA Ver       :   001
BootRom Ver    :   301
CPLD 1 Ver     :   006
CPLD 2 Ver     :   006
```

Table 15 Command output

Field	Description
Slot No.	Slot number of the card
Brd Type/Type	Card model. If this field is NONE, no card is in the slot.
Brd Status/Status	Running status of the card: • **Master**—The card is an active MPU. • **Slave**—The card is a standby MPU. • **Absent**—No card is in the slot. • **Fault**—The card is booting or the card has failed. • **Normal**—The card is an LPU that is correctly operating.
Subslot Num	The maximum number of sub-cards supported by the card.
Sft Ver/ Software Ver	Software version of the card
Patch Ver	Patch version of the card. If this field is NONE, no patch is installed on the card.
PCB 1 Ver	Version of PCB 1 on the card
FPGA Ver	FPGA version of the card
BootRom Ver	Boot ROM version of the card
CPLD 1 Ver	Version of CPLD 1 on the card
Chip	Chip number of the card

Field	Description
Learning Mode	MAC learning mode of the card: • Independent VLAN learning (IVL) • Shared VLAN learning (SVL)

Displaying electronic label data

- Use the **display device manuinfo** command to display the electronic label data for a card.

```
<Sysname> display device manuinfo
 Slot 0:
 DEVICE_NAME          : HP 7500 384Gbps Fab/MPU w 2p 10-GbE XFP JD193B
 DEVICE_SERIAL_NUMBER : CN12D4W123
 MAC_ADDRESS          : 1234-5678-9123
 MANUFACTURING_DATE   : 2011-2-24
 VENDOR_NAME          : HP
 Slot 1:
 DEVICE_NAME          : HP 7500 384Gbps Fab/MPU w 2p 10-GbE XFP JD193B
 DEVICE_SERIAL_NUMBER : CN12D4W456
 MAC_ADDRESS          : 0023-895F-954F
 MANUFACTURING_DATE   : 2011-2-27
 VENDOR_NAME          : HP
 Slot 2:
 DEVICE_NAME          : HP 7500 48-port Gig-T PoE-upg SA Mod JD199B
 DEVICE_SERIAL_NUMBER : CN12D4W789
 MAC_ADDRESS          : NONE
 MANUFACTURING_DATE   : 2011-2-15
 VENDOR_NAME          : HP
 Slot 4:
 DEVICE_NAME          : HP 7500 48p 10/100Base-T PoE-upg SA Mod JD198B
 DEVICE_SERIAL_NUMBER : CN12D4W9BC
 MAC_ADDRESS          : NONE
 MANUFACTURING_DATE   : 2011-2-18
 VENDOR_NAME          : HP
 Slot 5:
  The operation is not supported on the specified board or subslot.
 Slot 6:
  The operation is not supported on the specified board or subslot.
```

- Use the **display device manuinfo slot** *slot-number* command to display the electronic label data for a card, for example, the card in slot 0:

```
<Sysname> display device manuinfo slot 0
 Slot 0:
 DEVICE_NAME          : HP 7500 384Gbps Fab/MPU w 2p 10-GbE XFP JD193B
 DEVICE_SERIAL_NUMBER : CN12D4W123
 MAC_ADDRESS          : 0023-895F-958B
 MANUFACTURING_DATE   : 2011-2-24
 VENDOR_NAME          : HP
```

Table 16 Command output

Field	Description
DEVICE_NAME	Card model
DEVICE_SERIAL_NUMBER	Card serial number
MAC_ADDRESS	MAC address of the card. • An MPU has a MAC address. • An LPU has no MAC address (the field is NONE).
MANUFACTURING_DATE	Manufacturing date of the card
VENDOR_NAME	Vendor name of the card
The operation is not supported on the specified board or subslot	The card is a virtual LPU and does not support the **display device manuinfo** command.

Displaying card CPU usage statistics

Use the **display cpu-usage** command to display card CPU usage statistics:

```
<Sysname> display cpu-usage
Slot 0 CPU usage:
       2% in last 5 seconds
       1% in last 1 minute
       1% in last 5 minutes

Slot 1 CPU usage:
       1% in last 5 seconds
       1% in last 1 minute
       1% in last 5 minutes

Slot 2 CPU usage:
       3% in last 5 seconds
       2% in last 1 minute
       2% in last 5 minutes

Slot 4 CPU usage:
       2% in last 5 seconds
       2% in last 1 minute
       2% in last 5 minutes

Slot 5 CPU usage:
       3% in last 5 seconds
       2% in last 1 minute
       2% in last 5 minutes

Slot 6 CPU usage:
       2% in last 5 seconds
       2% in last 1 minute
       2% in last 5 minutes
```

Table 17 Command output

Field	Description
Slot x CPU usage	CPU usage of the card in slot x If the card has multiple CPUs, "Slot x CPU usage" shows statistics for the primary CPU. "Slot x CPU 1 CPU usage" shows statistics for the secondary CPU.
1% in last 5 seconds	The average CPU usage for the last five seconds.
1% in last 1 minute	The average CPU usage for the last minute.
1% in last 5 minutes	The average CPU usage for the last five minutes.

Displaying card memory usage statistics

- Use the **display memory** command to display the memory usage of the active MPU:

```
<Sysname> display memory
System Total Memory(bytes): 435927120
Total Used Memory(bytes): 100618856
Used Rate: 23%
```

- Use the **display memory slot** *slot-number* command to display the memory usage of a card:

```
<Sysname> display memory slot 0
System Total Memory(bytes): 435562480
Total Used Memory(bytes): 103701596
Used Rate: 23%
```

Table 18 Command output

Field	Remarks
System Total Memory(bytes)	Total memory (in bytes) of the card
Total Used Memory(bytes)	Used memory (in bytes) of the card
Used Rate	Used memory as a percentage of the total memory of the card

Displaying CF card information

Use the **display device cf-card** command to display CF card information:

```
<Sysname> display device cf-card
 CF Card Information in slot 0 :
 Status: Normal
 Size  : 256 MB

 CF Card Information in slot 1 :
 Status: Absent
```

Table 19 Command output

Field	Description
CF Card Information in slot 0	Number of the slot that holds the CF card

Field	Description
Status:	Operating status of the CF card: • **Absent**—No CF card is in the slot. • **Fault**—The CF card is faulty. • **Normal**—The CF card is correctly operating.
Size:	Memory size of the CF card

Displaying the operating status of the fan assembly

Use the **display fan** command to display the operating status of the fan assembly:

```
<Sysname> display fan
 Fan     1 State: Normal
```

Table 20 Command output

Field	Remarks
Fan 1	Fan assembly number
State	Fan assembly status: • **Normal**—The fan assembly is correctly operating. • **Absent**—The fan assembly is absent. • **Fault**—The fan assembly has failed.

Displaying the operating status of power supplies

Use the **display power** command to display the operating status of power supplies:

```
<Sysname> display power
 Power        1 State: Normal
 Power        2 State: Absent
```

Table 21 Command output

Field	Description
Power 1	Power supply number
State	Power supply status: • **Normal**—The power supply is correctly operating. • **Absent**—The power supply is absent. • **Fault**—The power supply has failed.

Configuring the temperature thresholds for a card

The switch sends traps when the temperature of a card crosses the lower or upper temperature threshold. You can change the temperature threshold settings for a card as needed so you can remove the alarm condition in time.

To configure and display the temperature thresholds for a card:

Step	Command	Remarks
1. Enter system view	**system-view**	N/A
2. Configure the temperature thresholds for a card (in standalone mode)	**temperature-limit slot** *slot-number* **hotspot** *sensor-number lowerlimit warninglimit* [*alarmlimit*]	Optional. By default, the lower temperature threshold is 0°C (32°F), the warning threshold is 80°C (176°F), and the alarming threshold is 97°C (206.6°F).
3. Configure the temperature thresholds for a card (in IRF mode)	**temperature-limit chassis** *chassis-number* **slot** *slot-number* **hotspot** *sensor-number lowerlimit warninglimit [alarmlimit]*	The warning and alarming thresholds must be higher than the lower temperature threshold. The alarming threshold must be higher than the warning threshold.
4. Display card temperature information	**display environment**	Optional. Available in any view.

Port configuration and management

Configuring a combo interface

What is a combo interface

On a 7500 switch, a combo interface is a logical interface that comprises one SFP fiber port and one RJ-45 copper Ethernet port, which are called combo ports. The two ports share one forwarding interface and cannot work simultaneously. When you enable the RJ-45 port, the SFP port is automatically disabled and placed in the inactive state, and vice versa. By default, the port with a smaller number is active.

You can use the **display port combo** command to identify the combo interfaces on the switch and the active status of their member ports.

```
[Sysname] display port combo
  Combo-group         Active                    Inactive
        1         GigabitEthernet2/0/1       GigabitEthernet2/0/5
        2         GigabitEthernet2/0/2       GigabitEthernet2/0/6
        3         GigabitEthernet2/0/3       GigabitEthernet2/0/7
        4         GigabitEthernet2/0/4       GigabitEthernet2/0/8
```

You can use the **display interface** *interface-type interface-number* command to identify the medium type of a combo port:

- If the output includes "Media type is not sure, Port hardware type is No connector," the port is an SFP fiber port. For example, the following output shows that GigabitEthernet 2/0/1 is an SFP port.

```
[Sysname] display interface GigabitEthernet 2/0/1
 GigabitEthernet2/0/1 current state: DOWN
 IP Packet Frame Type: PKTFMT_ETHNT_2, Hardware Address: 0000-fc00-7506
 Description: GigabitEthernet2/0/1 Interface
 Loopback is not set
 Media type is not sure,Port hardware type is No connector
 Unknown-speed mode, unknown-duplex mode
 Link speed type is autonegotiation, link duplex type is autonegotiation
```

- If the output includes "Media type is twisted pair, Port hardware type is 1000_BASE_T," the port is an RJ-45 copper port. For example, the following output shows that GigabitEthernet 2/0/5 is an RJ-45 1000 BASE-T port.

```
[Sysname] display interface GigabitEthernet 2/0/5
 GigabitEthernet2/0/5 current state: DOWN ( Administratively )
 IP Packet Frame Type: PKTFMT_ETHNT_2, Hardware Address: 0000-fc00-7506
 Description: GigabitEthernet2/0/5 Interface
 Loopback is not set
 Media type is twisted pair
 Port hardware type is  1000_BASE_T
 Unknown-speed mode, unknown-duplex mode
 Link speed type is autonegotiation, link duplex type is autonegotiation
```

To activate a combo port:

Step		Command	Remarks
1.	Enter system view.	**system-view**	N/A
2.	Enter the interface view of combo SFP or RJ-45 port.	**interface** *interface-type interface-number*	N/A
3.	Activate the port.	**undo shutdown**	Required. The other port in the pair automatically shuts down and transitions to the inactive state.

Enabling active/standby mode for the network ports on MPUs

The LSQ1SRP2XB MPU provides Ethernet network ports for forwarding traffic. When the 7503, 7506, 7506-V, or 7510 switch has two LSQ1SRP2XB MPUs, the Ethernet network ports on the MPUs work in one of the following modes:

- **Concurrent mode**—The network ports of both MPUs forward traffic concurrently. These ports can still forward traffic when an active/standby switchover has occurred upon a software failure. If the active/standby switchover is caused by a hardware failure, the network ports on the failed MPU might not be able to correctly forward data. You can use this mode to increase network ports.
- **Active/standby mode**—Only the Ethernet network ports on the active MPU can forward data, and the Ethernet network ports on the standby MPU function as backups. When an active/standby switchover has occurred, the network ports on the previous active MPU goes down, and the network ports on the previous standby MPU comes up to take over. You can connect the Ethernet network ports on the two MPUs to upstream devices to increase availability.

NOTE:

If LSQ1SRP2XB MPUs are used, the switch creates one virtual LPU slot for each MPU slot, and the LPU slot numbers are higher than the largest physical LPU slot number. To configure the Ethernet ports on one MPU, you must access the virtual LPU for the MPU.

Configuration guidelines

- This feature is available only for the LSQ1SRP2XB MPUs.

- To avoid forwarding loops, enable active/standby mode before you connect the Ethernet network ports on the MPUs.

Configuration procedure

To enable active/standby mode for the Ethernet network ports on the MPUs:

Step		Command	Remarks
1.	Enter system view	**system-view**	N/A
2.	Enable active/standby mode for the Ethernet ports on the MPUs	**strict-standby enable**	Optional. By default, concurrent mode applies.

Verifying and diagnosing transceiver modules

Verifying transceiver modules

You can verify the genuineness of a transceiver module in the following ways:

- Display the key parameters of a transceiver module, including its transceiver type, connector type, central wavelength of the transmit laser, transfer distance and vendor name.
- Display its electronic label. The electronic label is a profile of the transceiver module and contains the permanent configuration including the serial number, manufacturing date, and vendor name. The data is written to the storage component during debugging or testing.

To verify transceiver modules, perform the following commands in any view:

Task	Command
Display key parameters of the pluggable transceiver.	**display transceiver interface** [*interface-type interface-number*] [**|** { **begin** | **exclude** | **include** } *regular-expression*]
Display the electrical label information of the pluggable transceiver.	**display transceiver manuinfo interface** [*interface-type interface-number*] [**|** { **begin** | **exclude** | **include** } *regular-expression*]

Diagnosing transceiver modules

The device provides the alarm function and digital diagnosis function for transceiver modules. When a transceiver module fails or inappropriately work, you can check for alarms present on the transceiver module to identify the fault source or examine the key parameters monitored by the digital diagnosis function, including the temperature, voltage, laser bias current, TX power, and RX power.

To diagnose transceiver modules, perform the following commands in any view:

Task	Command
Display the current alarm information of the pluggable transceiver	**display transceiver alarm interface** [*interface-type interface-number*] [**|** { **begin** | **exclude** | **include** } *regular-expression*]

Task	Command
Display the currently measured values of the digital diagnosis parameters of the pluggable transceiver	**display transceiver diagnosis interface** [*interface-type interface-number*] [| { **begin** | **exclude** | **include** } *regular-expression*]

For more information about transceiver modules, see *HP A-Series Switches Transceiver Modules User Guide*.

For more information about transceiver-related commands, see *HP 7500 Switch Series Fundamentals Command Reference*.

Configuring a software exception handling method

Configuring an exception handling method

When you configure an exception handling method, follow these guidelines:

- If two MPUs are used, the reboot of the active MPU causes an active/standby switchover.
- If one MPU is used, the reboot of the active MPU causes the entire switch to reboot.
- An LPU always automatically reboots when it detects a software exception.

By default, an MPU automatically reboots when instruction error, illegal address error, data overflow, null pointer, reset, or any other software anomaly has occurred. You can also configure the MPUs to stay in the error condition without taking any protective action to preserve the error information for identifying the problem.

To configure a software exception handling method for MPUs:

Step		Command	Remarks
1.	Enter system view.	**system-view**	N/A
2.	Configure a software exception handling method for MPUs.	**system-failure** { **maintain** | **reboot** }	Optional. By default, an MPU reboots when software exception has occurred.

Displaying the exception handling method

Use the **display system-failure** command to display the exception handling method.

```
<Sysname> display system-failure
 System failure handling method: reboot
```

Displaying IRF information

Displaying information about all IRF member switches

Use the **display irf** command to display information about all IRF member switches.

```
<Sysname> display irf
```

```
Switch  Slot   Role    Priority    CPU-Mac        Description
 *+1     0    Master  1           00e0-fc0a-15e0  F1Num001
   1     1    Slave   1           00e0-fc0f-8c02  -----
   2     1    Slave   1           00e0-fc0f-8c1f  F1Num002
   2     1    Slave   1           00e0-fc0f-8c1g  -----
-------------------------------------------------------------------
 * indicates the device is the master.
 + indicates the device through which the user logs in.

 The Bridge MAC of the IRF is: 000f-e26a-58ed
 Auto upgrade                  : no
 Mac persistent                : always
 Domain ID                     : 30
 Auto merge                    : no
```

Table 22 Command output

Field	Description
Switch	Member ID. • The ID of the master is prefixed with an asterisk (*) sign. • The ID of the switch where you are logged in is prefixed with a plus (+) sign.
Slot	Number of the slot that holds the active or standby MPU.
Role	The role of an MPU in the IRF virtual device, including: • **Master**—The active MPU of the IRF fabric (also called IRF virtual device). • **Slave**—The standby MPU of the IRF fabric. • **SlaveWait**—The standby MPU of the IRF fabric. It is joining the IRF fabric. • **Loading**—The standby MPU of the IRF fabric. It is loading the system boot file.
Priority	Priority of a member switch
CPU-MAC	Bridge MAC address of the CPU of the switch
Description	Description of the member switch (---- is displayed if no description is configured). If the description of the member switch exceeds one line, three dots (…) are displayed at the end of the line, and the rest information is not displayed. To view the complete description, execute the **display current-configuration** command.
Bridge MAC of the IRF is	Bridge MAC address of the IRF fabric
Auto upgrade	The status of the automatic boot file updating function: • **yes**—Enabled. The IRF fabric automatically synchronizes the boot file of the master switch to the switch you are adding to the IRF fabric. • **no**—Disabled. You must manually ensure that the joining switch uses the same boot file as the master switch. If not, the new switch cannot join the IRF fabric.
MAC persistent	The bridge MAC address preservation setting of the IRF fabric: • **6 min**—The bridge MAC address of the IRF fabric does not change within six minutes after the master switch leaves. • **always**—The bridge MAC address of the IRF fabric does not change after the master switch leaves. • **no**—As soon as the master leaves, the IRF fabric uses the bridge MAC address of the newly elected master as its bridge MAC address.
Domain ID	IRF domain ID

Field	Description
Auto merge	Whether the auto-reboot for IRF fabric merge is enabled: • **yes**—Enabled • **no**—Disabled

Displaying the basic IRF settings of IRF member switches

Use the **display irf configuration** command to display the basic IRF settings that take effect after member switches reboot, including their member IDs, priority, and IRF port bindings.

- Display the basic IRF settings that take effect after the member switch reboots when it is operating in standalone mode:

```
<Sysname> display irf configuration
 MemberID Priority IRF-Port1                       IRF-Port2
 1        1        Ten-GigabitEthernet2/0/1        disable
```

- Display the basic IRF settings of all member switches after the member switches reboot and the IRF fabric is formed:

```
<Sysname> display irf configuration
 MemberID  NewID  IRF-Port1                       IRF-Port2
  1        1      Ten-GigabitEthernet1/2/0/1      disable
                  Ten-GigabitEthernet1/2/0/2
  2        2      disable                         Ten-GigabitEthernet2/3/0/1
                                                  Ten-GigabitEthernet2/3/0/2
```

Table 23 Command output

Field	Description
MemberID	Current member ID of the device. If no member ID has been assigned, this field displays two hyphens (--).
Priority	Member priority. This field is available only in standalone mode.
New-ID	The member ID re-assigned to the switch. This setting takes effect at reboot. This field is available only in IRF mode.
IRF-Port1	Ports bound to IRF port 1. To bring up IRF port 1, you must bind at least one physical port to it. If no ports have bound to IRF port 1, this field displays **disable**.
IRF-Port2	Ports bound to IRF port 2. To bring up IRF port 2, you must bind at least one physical port to it. If no ports have bound to IRF port 2, this field displays **disable**.

Displaying IRF topology information

Use the **display irf topology** command to display IRF topology information.

```
<Sysname> display irf topology
                              Topology Info
------------------------------------------------------------------------
             IRF-Port1                IRF-Port2
Switch    Link       neighbor      Link       neighbor    Belong To
```

```
1       DIS       --          UP        2          00e0-fc0f-8c0f
2       UP        1           DOWN      --         00e0-fc0f-8c0f
```

The output shows that IRF port 2 of member switch 1 connects to IRF port 1 of member switch 2.

Table 24 Command output

Field	Description
Switch	Member ID of the switch.
IRF-Port1	Information about IRF port 1, including its link state and neighbor.
IRF-Port2	Information about IRF port 2, including its link state and neighbor.
Link	Link state of the IRF port: • **UP**—The IRF link is up and operating correctly. • **DOWN**—The IRF link is down, for example, for a link problem. • **DIS**—No physical port is bound to the IRF port.
neighbor	The member ID of the switch that connects to this IRF port. If the IRF port does not connect to any switch, two hyphens (--) are displayed.
Belong To	The IRF fabric that the switch belongs to, represented by the CPU MAC address of the master switch.

Saving the running configuration

To save the running configuration, use one of the following methods:

- **Fast saving mode**—Executing the **save** command without the **safely** keyword. This mode saves configuration quickly but the configuration can be lost if a reboot or power failure has occurred during the saving process. Use this mode if stable power supply is available.
- **Safe mode**—Executing the **save** command with the **safely** keyword. This mode takes more time to save configuration, but it has no configuration loss risk even if the device reboots or the power supply fails during the saving process. Use this mode in an unstable power supply environment or for remote maintenance.

Use one of the following commands to save the running configuration:

Task	Command	Remarks
Save the running configuration to a file other than the startup file for the next reboot	**save** *file-url* [**all** | [**chassis** *chassis-number*] **slot** *slot-number*]	Available in any view. • The extension of the configuration file must be .cfg. • You specify **chassis** *chassis-number* only when the switch is in IRF mode. • The **all** keyword saves the configuration to all MPUs. • In standalone mode, if neither **all** nor **slot** *slot-number* are specified, the command saves the configuration to the active MPU. • In IRF mode, if neither **all** nor **chassis** *chassis-number* **slot** *slot-number* are specified, the command saves the configuration to the active MPU on the master switch.

Task	Command	Remarks
Save the running configuration to the root directory of the storage medium and specify the file as the startup configuration file for the next reboot	**save [safely][force]**	Available in any view.

NOTE:

The startup configuration file for the next reboot might be lost if a reboot or power failure has occurred during the saving process, and the switch will reboot with the default configuration. After the switch reboots, you must re-specify the startup configuration file for the next reboot.

For more information about the **save** commands, see *HP 7500 Switch Switches Fundamentals Configuration Guide*.

Rebooting a card or the switch

You must reboot the switch after you upgrade or maintain its boot file or configuration file. You must also reboot an MPU or LPU after you change its operating mode. The following methods are available for you to reboot the switch or a card:

- Reboot the switch or a card at once.
- Schedule an automatic reboot of the switch at a specific data and time, or after a certain amount of time.
- Power off and then power on the switch. Use this approach with caution. Powering off a running switch can cause data loss and hardware damages.

To reboot the switch or a card at once:

Task	Command	Remarks
Reboot the switch or a card other than the standby MPU at once (in standalone mode)	**reboot** [**slot** *slot-number*]	Available in user view. If no slot is specified, the command reboots the entire switch.
Reboot the standby MPU (in standalone mode)	**slave restart**	Available in system view.
Reboot the IRF virtual device, a member switch, or a card (in IRF mode)	**reboot** [**chassis** *chassis-number* [**slot** *slot-number*]]	Available in user view. • If neither chassis nor slot is specified, the command reboots all member switches. • If only a chassis is specified, the command reboots the specified member switch. • If you specify both a chassis and a slot, the command reboots the specified card in the specified switch.

To schedule a reboot of the switch:

Task	Command	Remarks
Schedule a reboot of the switch at a specific date and time	**schedule reboot at** *hh:mm* [*date*]	By default, no reboot schedules are set. Available in user view.
Schedule a reboot of the switch after a specific amount of time	**schedule reboot delay** { *hh:mm* | *mm* }	By default, no reboot schedules are set. Available in user view.

NOTE:

- To reboot the switch or the active MPU by using the **reboot** command, you must ensure that you have specified a main boot file.
- The switch prompts "REBOOT IN ONE MINUTE" one minute before the rebooting time and then reboots in one minute.
- For data security, the switch does not run a scheduled reboot task if you are performing a file operation at the scheduled reboot time.

Troubleshooting

Troubleshooting methods

When an HP 7500 switch fails, you can use the following methods to troubleshoot the switch:

- Command line interface (CLI) provided by the switch. At the CLI, you can use the related commands to display the hardware information, and locate the hardware failures. For more information about the CLI, see "Hardware management and maintenance."
- The main processing unit (MPU) provides the LEDs for the power supply system, fan assembly, MPUs, line processing units (LPUs), CF cards, and ports. You can locate the failures according to the LED status on the MPU. For more information about the LED status on the MPU, see "Appendix C LEDs."
- The LPU of the switch provides the port status LEDs, with which you can detect port failures. For more information about the LED status on the LPU, see "Appendix C LEDs."

NOTE:

If you cannot locate failures by following the guidelines in this chapter, see "Support and other resources."

TIP:

Clean your switch periodically because the noncompliant operating environments of switches might cause switch failures. At the same time, examine the installation environments against the requirements in "Preparing for installation." Make sure the switch operates in a compliant environment. Additionally, periodically perform the power-on test for the spare switches.

Troubleshooting the system

Troubleshooting on startup

After you power on the switch, if the switch operates correctly, the startup information appears on the console terminal. If the console terminal displays nothing or garbled characters, use the following methods to troubleshoot the switch.

No terminal display

If the configuration terminal displays nothing when the switch is powered on, verify the following items:

- The power supply system is operating correctly.
- The MPU is operating correctly.
- The console cable has been connected to the console port of the MPU.

If no problem is found, the following failure reasons might apply:

- The console cable is connected to an incorrect serial interface (the serial interface in use is not the one set on the terminal). To solve this problem, select a correct serial interface.
- The console cable fails. To solve this problem, replace the console cable.

Garbled terminal display

If terminal display is garbled, verify that the following settings are configured for the terminal, for example, HyperTerminal:

- **Baud rate**—9,600
- **Data bits**—8
- **Parity**—none
- **Stop bits**—1
- **Flow control**—none
- **Emulation**—VT100

When you modify the settings for the console port of the switch, configure the same settings for the console terminal.

Troubleshooting the switch during operation

At the CLI, you can use related commands to display the switch information and locate the failures. For more information about the CLI, see "Hardware management and maintenance."

When you detect configuration errors, re-configure the switch or restore the factory settings for the switch.

Power supply system failure

When the switch operates correctly, the LEDs related to the power supply system are as follows:

- The LED on the power supply is green. On a power supply with multiple LEDs, each LED indicates the status of a function. For more information, see "Appendix C LEDs."
- For the PWR LEDs on the MPU, the OK LED is on, and the Fail LED is off.

NOTE:

- For more information about the PWR LEDs on an MPU and the LEDs on a power supply, see "Appendix C LEDs."
- After the power supply to the power supply is turned off, it is normal that the LEDs stay on for a period of time.

When the LEDs do not conform to the status mentioned above, the power supply does not work correctly. To troubleshoot the power supply system:

1. Verify that the switches of the power supply are turned on. Power supplies 1400W DC, 2800W AC, and 6000W AC each have a system power switch and a PoE power switch. If PoE is not enabled on the switch, you do not need to turn on the PoE power switch and you only need to make sure the system power switch is turned on.
2. Examine the power supply for an over-temperature condition. When a power supply is over-temperature, it enters the self protection state. Make sure the switch is well ventilated.
3. Examine the power cable for a loose connection. If a power cable is loose, re-plug the power cable. If a power cable is broken, replace it.
4. Examine the power supply installation. If the power supply is not fully seated, re-install the power supply to make sure it has a close contact with the backplane of the switch.

5. Examine the power supply system. Make sure the power supply system operates correctly and provides a normal voltage.
6. If the switch has empty power supply slots, plug the power supply into an empty power supply slot, and verify that the power supply can operate correctly.
7. Plug a new power supply of the same model into the same slot, and connect it to the same power input end. If the new power supply can work correctly, the old power supply fails. Contact the agents to replace the old power supply.

Fan failure

The fan LEDs on the MPU include an OK LED and a FAIL LED. When the fan assembly is operating correctly, the OK LED is on, and the FAIL LED is off.

If the fan assembly has failed, the OK LED is off or the FAIL LED is on.

To troubleshoot the fan assembly:

1. Verify that the power supply is operating correctly. For more information, see "Power supply system failure."
2. Verify that the air intakes and exhaust vents of the chassis are not blocked. If they are blocked, clean them to keep good ventilation.
3. Verify that the fan assembly is fully seated. You can unplug the fan assembly, plug it again, and then fix the screws.
4. Verify that the empty LPU slots and power supply slots are installed with blank filler panels. If not, install blank filler panels for them to guarantee good ventilation.

MPU failure

The status LEDs on the MPU show the status of a card in the corresponding slot. According to the slot number of an MPU, you can examine the corresponding LEDs for the MPU.

When the MPU operates correctly, the RUN LED flashes, and the ALM LED is off. When the RUN LED is off, the MPU fails. To troubleshoot the MPU:

1. Verify that the power supply is operating correctly. For more information, see "Power supply system failure."
2. Verify that the MPU model is compatible with the chassis. For more information, see "Appendix B FRUs and compatibility matrixes."
3. Press the RESET button of the MPU to reset the MPU. After the MPU is reset, verify that the corresponding RUN LED is on.
4. Verify that the MPU is fully seated. You can unplug the MPU, plug it again, and make sure the MPU is fully seated.
5. If the switch has empty MPU slots, plug the MPU into an empty MPU slot, and verify that the MPU can operate correctly.

LPU failure

The status LEDs on the MPU show the status of a card in the corresponding slot. According to the slot number of an LPU, you can check the corresponding LEDs for the LPU.

When the LPU operates correctly, the RUN LED flashes, and the ALM LED is off. When the RUN LED is off, the LPU fails. To troubleshoot the LPU:

1. Verify that the MPU is operating correctly. For more information, see "MPU failure."
2. Verify that the console terminal prompts that the software version is incompatible with the LPU in the current slot. An LPU is compatible with a specific software version. If the software version is incompatible with the LPU, upgrade the software to a compatible version.
3. Calculate the overall power consumption, and make sure your power supply can provide enough power. For more information, see "Appendix B FRUs and compatibility matrixes."
4. Verify that the LPU is fully seated. You can unplug the LPU, plug it again, and press the ejector levers inward until the ejector levers touch the panel tightly.
5. If the switch has empty LPU slots, plug the LPU into an empty LPU slot, and verify that the LPU can work correctly.

Port failure

The ports provided by MPUs and LPUs all have corresponding LEDs. When a port connected to the network operates correctly, the corresponding LED is on.

NOTE:

A management Ethernet port, SFP+ port, or XFP port each has two LEDs, LINK and ACT. The LED mentioned in this section for such a port refers to the LINK LED. Each port of any other type has only one LED.

If the LED of a port connected to the network is off, the port or the connecting cable might fail. To troubleshoot the port:

1. Verify that the MPU or LPU where the port resides is operating correctly. For more information, see "MPU failure" or "LPU failure."
2. Examine the cable connection of the port. For how to correctly connect the cable to an Ethernet port with an RJ-45 connector or a fiber port, see "Connecting your switch to the network."
3. Verify that the cable is not broken. Use the cable to connect two ports of the same type that operate correctly. If the LEDs of the two ports are on, the cable is normal. Otherwise, the cable fails. Use a compliant cable to connect the port. For more information about the compliant cables, see "Appendix D Cables."
4. If the port uses a transceiver module, verify that the port type is compatible with the transceiver module and that the transceiver module is compatible with the cable. For more information, see "Appendix B FRUs and compatibility matrixes."
5. If the port uses a transceiver module, make sure the current transceiver module operates correctly by replacing a normal transceiver.
6. If the port is a combo interface (which contains a fiber port and a copper port), make sure the port used for connection is activated for the combo interface. Then, use the **undo shutdown** command to activate the port, and check the LED. For more information, see "Hardware management and maintenance."

NOTE:

- A combo interface comprises an SFP port and an RJ-45 Ethernet port. Only one of them can be activated at a time.
- If a port is brought down by the **shutdown** command, use the **undo shutdown** command to bring up the port.
- After a port fails, if the switch has an idle port of the same type, you can plug the cable into the idle port..

7. Verify that the speed and duplex settings of the ports of a link are the same. Make sure two ports can work together.

CF card failure

The MPU provides a CFS LED. When the CF card operates correctly, the CFS LED is on.

If the CFS LED is off, the CFD card fails. To troubleshoot the CF card:

1. Verify that the MPU is operating correctly. For more information, see "MPU failure."
2. If the CF card fails because you execute the **umount** command, you can execute the **<Sysname> mount cfa0:** command in user view to re-mount the CF card.
3. Verify that the CF card is fully seated.
4. If you have a backup CF card, replace the current CF card with it to examine whether the current CF card fails. For more information, see "Replacement procedures." After the replacement, if the CFS LED is on, you can be sure that the previous CF card fails.

PoE system failure

If the switch cannot supply power for a PD attached to the switch, troubleshoot the PoE system, as follows:

1. Make sure you have set up the PoE system for the switch as follows: use the PoE-capable switch and LPUs, use the PoE-capable power supply system, and configure the PoE dual-in-line memory (DIMM) modules for LPUs except LSQ3GV48SC0 and LSQ1GV48SD0. For more information, see "Installing FRUs."
2. Make sure the PoE system can provide enough power for all attached PDs. For information about the maximum PoE power consumption, see "Appendix A Chassis views and technical specifications."
3. Verify that the cable that connects the switch to the PD is a straight-through cable.
4. Make sure PoE-related configurations are correct. For how to configure PoE, see the related configuration guide.

Replacement procedures

The 7500 Switch Series uses a modular, hot-swappable architecture, and supports field replaceable units (FRUs). You can replace any of FRUs when the switch is running.

CAUTION:

When replacing hot swappable modules when the switch is running, notice safety with electricity.

Replacing a power supply

WARNING!

- Strictly follow the procedures shown in Figure 46 and Figure 47 to replace a power supply to avoid device or bodily injury.
- An AC power supply and a DC power supply cannot be installed on the same 7500 switch, and power supplies with different models cannot be installed on the same 7500 switch. When you use two power supplies to supply power, and the power supplies to be replaced are of different models, power off the switch before replacement to avoid damage to the switch.
- When you use two power supplies to supply power to the switch, make sure each power supply has a separate circuit breaker. Before replacing a power supply, turn off the circuit breaker on the power supply.

Replace a power supply in the following cases:

- The power supply is faulty.
- The power of the current power supply cannot satisfy the power requirements of the switch. For example, when the power supply does not support PoE, or the PoE output power of the power supply cannot satisfy the PoE power supply requirements. To ensure normal operation of the connected PDs, use a power supply with a higher power. For power supply compatibility information, see "Appendix B FRUs and compatibility matrixes."

The system power consumption is the total dynamic power consumption of all MPUs plus the total dynamic power consumption of all the LPUs plus the maximum power consumption of fans. For more information, see "Appendix A Chassis views and technical specifications."

Figure 46 Power supply removal flow

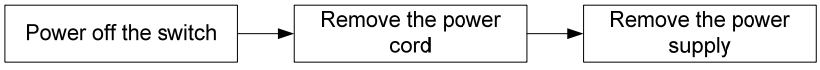
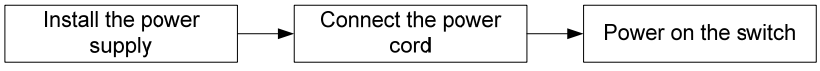


Figure 47 Power supply installation flow



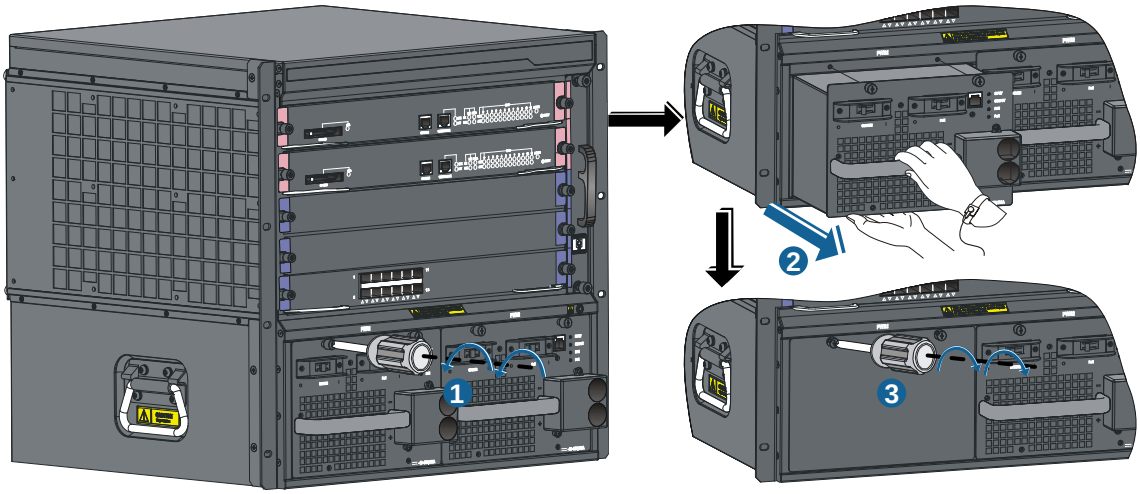
To replace a power supply:

1. Prepare an antistatic mat to place the removed power supply.

2. Wear an ESD wrist strap and make sure it makes good skin contact and is well grounded. For more information, see "Installing FRUs."
3. Turn off the switch on the power supply.
4. Remove the cable from the power supply.
5. Use a Philips screwdriver to loosen the captive screw on the power supply, as shown in callout 1 on Figure 48.
6. Holding the power supply handle with one hand and supporting the bottom of the power supply with the other, gently pull the power supply out, as shown in callout 2 on Figure 48.
7. Put the removed power supply on the antistatic mat.
8. Install a new power supply. For the installation procedures, see "Installing FRUs."

   After removing the power supply, if you do not install a new power supply, install a blank panel. As shown in callout 3 on Figure 48, align the screws on the blank panel with the screw holes on the switch, and then use a screwdriver to fasten the screws on the blank panel.

Figure 48 Removing the power supply



(1) Loosen the captive screw	(2) Pull the power supply out
(3) Fasten the screw on the blank panel (optional)	

Replacing a card

The card replacement procedures for the 7500 Switch Series are the same.

Remove the cables on an MPU or LPU before removing the MPU or LPU.

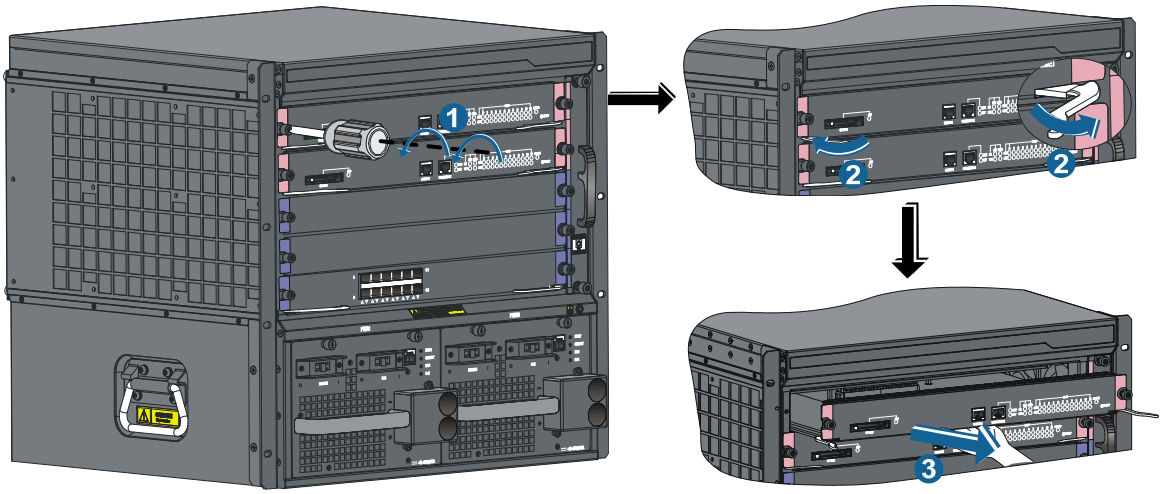
To replace a card:

1. Prepare an antistatic mat to place the removed card.
2. Wear an ESD wrist strap and make sure it makes good skin contact and is well grounded. For more information, see "Installing FRUs."
3. Use a Phillips screwdriver to remove the captive screw on the card, as shown in callout 1 on Figure 49.
4. Move the ejector levers outwards to separate the card from the backplane, as shown in callout 2 on Figure 49.

5. Use one hand to slowly move the card outwards. Supporting the bottom of the card with the other hand, pull the card out of the slot along slide rails, as shown in callout 3 on Figure 49.
6. Put the removed card on the antistatic mat.
7. Install a new card. For the installation procedures, see "Installing FRUs."

   If no new card is to be installed, install a blank panel to ensure heat dissipation of the switch and prevent dust from entering the switch.

Figure 49 Replacing a card



(1) Loosen the captive screw	(2) Move the ejector levers outwards
(3) Supporting the bottom of the card, pull out the card	

Replacing a fan assembly

CAUTION:

- When replacing the fan assembly, do not touch the rotating fans to avoid bodily injury.
- To ensure normal operation of the switch, install a new fan assembly within five minutes after the fan assembly is removed.

When the fan assembly fails, replace the fan assembly to ensure normal operation of the switch.

The fan assembly handle of the 7506-V is different from other models.

- The fan assembly handle of the 7506-V adopts a snap-in design. To remove or install a fan assembly, rotate the handle out first, as shown in Figure 50.
- The fan assembly handle of the other models of the 7500 Switch Series is fixed to the fan assembly, as shown in Figure 51.

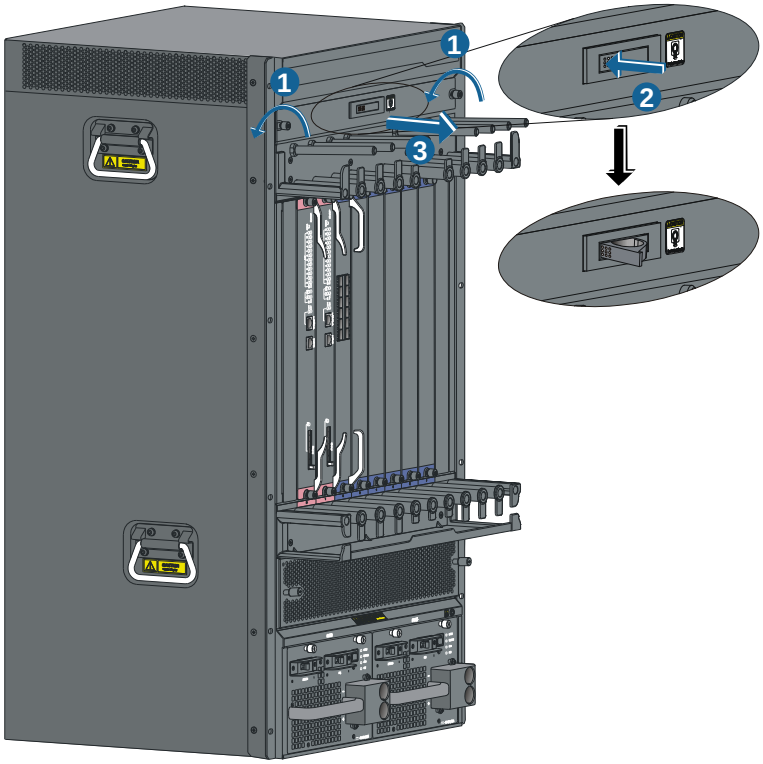
Replacing an 7506-V fan assembly

Removing a fan assembly

1. Prepare an antistatic mat to place the removed fan assembly.
2. Wear an ESD wrist strap and make sure it makes good skin contact and is well grounded. For more information, see "Installing FRUs."

3. Use a screwdriver to remove the captive screw on the fan assembly, as shown in callout 1 on Figure 50.
4. Press the left side of the fan assembly handle to rotate it out from the slot, as shown in a callout 2 on Figure 50.
5. Supporting the fan assembly by its bottom with one hand, hold the fan assembly handle with the other hand to pull the fan assembly out of the slot.
6. Put the removed fan assembly on the antistatic mat or its original shipping materials.

Figure 50 Replacing a fan assembly for an HP 7500-V



(1) Loosen the captive screw	(2) Press the left side of the fan assembly handle to rotate it out from the slot
(3) Pull the fan assembly out of the slot	

Installing a fan assembly

1. Wear an ESD wrist strap and make sure it makes good skin contact and is well grounded. For more information, see "Installing FRUs."
2. Unpack a new fan assembly and push it into the fan assembly slot along the slide rails until it has a close contact with the backplane.
3. Use a screwdriver to fasten the captive screw on the fan assembly.
4. Check the FAN LEDs on the MPU of the switch. If the OK LED is on, the fan assembly is installed successfully. For more information about the FAN LEDs, see "Appendix C LEDs."

NOTE:

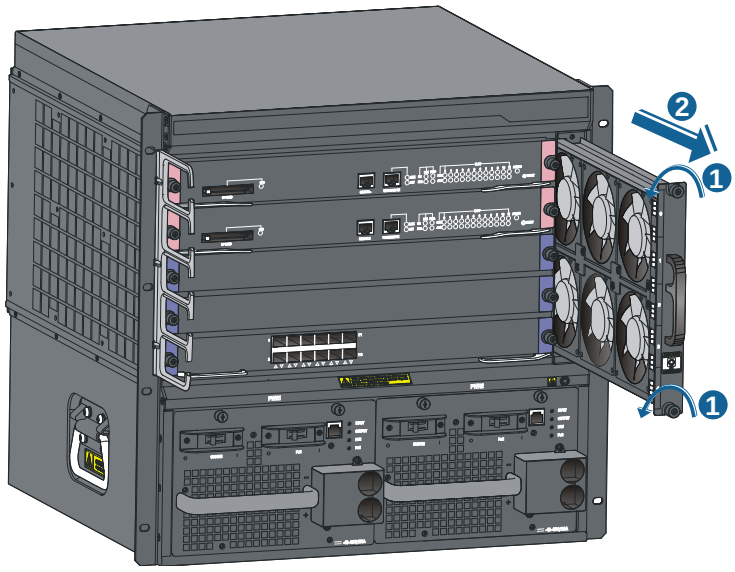
- Make sure the fan assembly handle has been pushed in to the slot after installation.
- You can check the fan status at the CLI. For more information, see "Hardware management and maintenance."

Replacing the fan assembly of other models

Removing a fan assembly

1. Prepare an antistatic mat to place the removed fan assembly.
2. Wear an ESD wrist strap and make sure it makes good skin contact and is well grounded. For more information, see "Installing FRUs."
3. Use a screwdriver to remove the captive screw on the fan assembly, as shown in callout 1 on Figure 51.
4. As shown in callout 2 on Figure 51, hold the handle of the fan assembly to pull the fan assembly out of the slot.
5. Put the removed fan assembly on an antistatic mat or in its original shipping materials.

Figure 51 Replacing a fan assembly for other models



(1) Loosen the captive screw on the fan assembly (2) Pull the fan assembly out of the slot

Installing a fan assembly

1. Wear an ESD wrist strap and make sure it makes good skin contact and is well grounded. For more information, see "Installing FRUs."
2. Unpack a new fan assembly and insert it into the fan assembly slot along the slide rails. Push the fan assembly in the slot until it has a close contact with the backplane.
3. Use a screwdriver to fasten the captive screw on the fan assembly.
4. Check the FAN LEDs on the MPU of the switch. If the OK LED is on, the fan assembly is installed successfully. For more information about the FAN LEDs, see "Appendix C LEDs."

NOTE:

You can check the fan status at the command line interface (CLI) after replacement. For more information, see "Hardware management and maintenance."

Replacing a CF card

CAUTION:

Do not remove the CF card when the switch is booting or the CF card LED is flashing. Otherwise, the file system on the hardware or the CF card might be damaged.

Before replacing a CF card, execute the **umount** command to unmount the CF card to ensure that the file system on the CF card is not damaged when you remove the CF card.

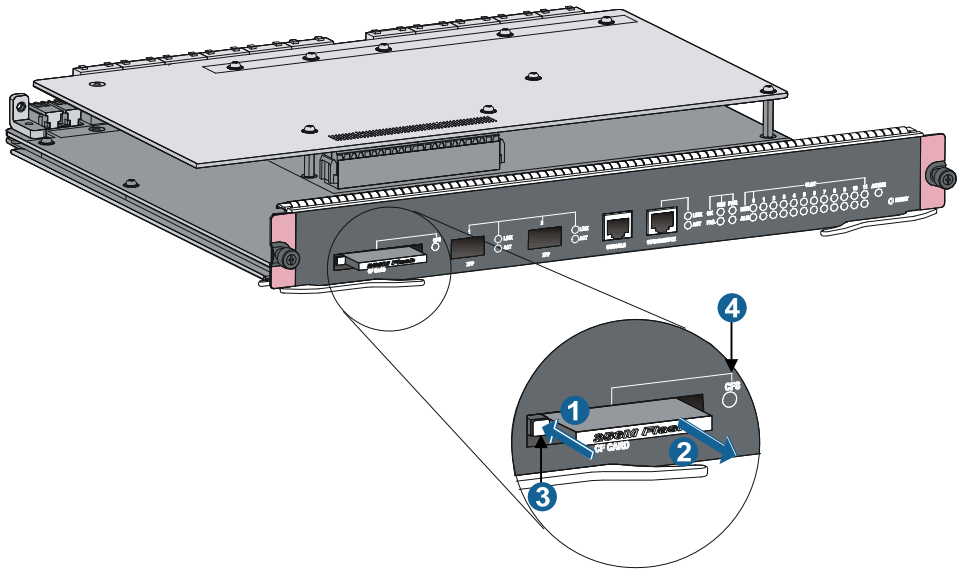
After you execute the **umount cf** command, if you want to continue to use the CF card, execute the **mount cf** command in user view to load the CF card again.

After you replace the CF card, the system automatically loads the CF card.

To replace a CF card:

1. Log in to the switch to execute the **umount** command. For how to log in to the switch, see "Connecting your switch to the network."
2. Press the eject button of the CF card reader as shown in callout 1 of Figure 52. The reader ejects the card part way out of the slot.
3. Remove the CF card from the reader and put it in an antistatic shielding bag.
4. Install a new CF card. For the installation procedures, see "Installing FRUs."

Figure 52 Replacing the CF card



(1) Press the eject button of the CF card reader	(2) The reader ejects the card part way out of the slot
(3) The ejector button of the CF card reader	(4) CF card status LED

Replacing a transceiver module

⚠ WARNING!

When you install or remove a module:

- Do not stare at the fibers to avoid hurting your eyes.
- Do not touch the golden fingers on the module.

Make sure the optical transceiver modules at the two ends of an optical fiber are of the same model.

Replacing an XFP/SFP+/SFP/QSFP+ module

1. Wear an ESD wrist strap and make sure it makes good skin contact and is well grounded. For more information, see "Installing FRUs."
2. Remove the optical fibers on the module.
3. Pivot the clasp down to the horizontal position.

   For a QSFP+ module that uses a plastic pull latch, skip this step. QSFP+ modules use either a metal or plastic pull latch.
4. Grasp the clasp on the transceiver module and carefully pull the module out of the slot.
5. Put the dust plug on the removed transceiver module, and put the remove module into its original shipping materials.
6. Install a new module.

   For the installation procedures, see "Installing FRUs."

Replacing a CFP module

1. Wear an ESD wrist strap and make sure it makes good skin contact and is well grounded.

   For more information, see "Installing FRUs."
2. Remove the optical fibers on the module.
3. Loosen the captive screws on the module.
4. Carefully pull the module out of the slot.
5. Put the dust plug on the removed module, and put the removed module into its original shipping materials.
6. Install a new module.

   For the installation procedures, see "Installing FRUs."

Replacing an SFP+/QSFP+/QSFP+ to SFP+ cable

When you replace an SFP+/QSFP+/QSFP+ to SFP+ cable, follow these guidelines:

- The bend radius of the cable must be at least eight times the cable diameter.
- If the cable cannot be removed or installed, verify that the removal or installation procedures are correct.

- When you remove a cable, pull the pull latch horizontally. Otherwise, the cable cannot be removed smoothly, or even the module or slot could be damaged.

To replace an SFP+/QSFP+/QSFP+ to SFP+ cable:

1. Wear an ESD wrist strap and make sure it makes good skin contact and is well grounded. For more information, see "Installing FRUs."
2. Gently press the cable plug in, and then pull the pull latch on the cable outward to pull out the cable plug.
3. Install a new cable. For the installation procedures, see "Installing FRUs."

Replacing the PoE DIMM

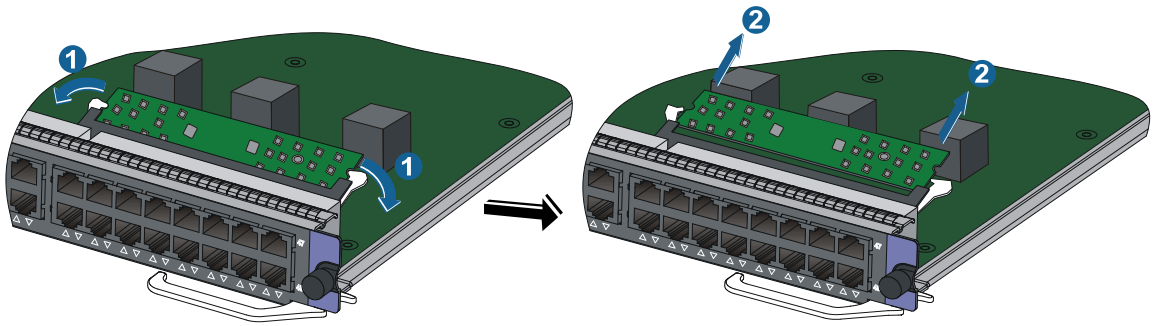
NOTE:

Before replacing a PoE DIMM, remove the cables on the card where the PoE DIMM is installed, and then remove the card from the switch. For information about removing a card, see "Replacing a card."

To replace a PoE DIMM:

1. Wear an ESD wrist strap and make sure it makes good skin contact and is well grounded. For more information, see "Installing FRUs."
2. Place the card steadily. Find the PoE DIMM slot (there is a Master mark on the PCB under the slot) on the PCB.
3. Pull the white clips on the two sides of the PoE DIMM slot outward, as shown in callout 1 on Figure 53.
4. Pull the PoE DIMM out along the guide rails, as shown in callout 2 on Figure 53.
5. Put the removed PoE DIMM on its original shipping materials.
6. Install a new PoE DIMM. For the installation procedures, see "Installing FRUs."

Figure 53 Installing a PoE DIMM



(1) Pull the white clips on the two sides of the DIMM outward

(2) Pull the PoE DIMM out along the guide rails

Support and other resources

Contacting HP

For worldwide technical support information, see the HP support website:

http://www.hp.com/support

Before contacting HP, collect the following information:

- Product model names and numbers
- Technical support registration number (if applicable)
- Product serial numbers
- Error messages
- Operating system type and revision level
- Detailed questions

Subscription service

HP recommends that you register your product at the Subscriber's Choice for Business website:

http://www.hp.com/go/wwalerts

After registering, you will receive email notification of product enhancements, new driver versions, firmware updates, and other product resources.

Related information

Documents

To find related documents, browse to the Manuals page of the HP Business Support Center website:

http://www.hp.com/support/manuals

- For related documentation, navigate to the Networking section, and select a networking category.
- For a complete list of acronyms and their definitions, see *HP FlexNetwork Technology Acronyms*.

Websites

- HP.com http://www.hp.com
- HP Networking http://www.hp.com/go/networking
- HP manuals http://www.hp.com/support/manuals
- HP download drivers and software http://www.hp.com/support/downloads
- HP software depot http://www.software.hp.com
- HP Education http://www.hp.com/learn

Conventions

This section describes the conventions used in this documentation set.

Command conventions

Convention	Description
Boldface	**Bold** text represents commands and keywords that you enter literally as shown.
Italic	*Italic* text represents arguments that you replace with actual values.
[ ]	Square brackets enclose syntax choices (keywords or arguments) that are optional.
{ x | y | ... }	Braces enclose a set of required syntax choices separated by vertical bars, from which you select one.
[x | y | ...]	Square brackets enclose a set of optional syntax choices separated by vertical bars, from which you select one or none.
{ x | y | ... } *	Asterisk-marked braces enclose a set of required syntax choices separated by vertical bars, from which you select at least one.
[x | y | ...] *	Asterisk-marked square brackets enclose optional syntax choices separated by vertical bars, from which you select one choice, multiple choices, or none.
&<1-n>	The argument or keyword and argument combination before the ampersand (&) sign can be entered 1 to n times.
#	A line that starts with a pound (#) sign is comments.

GUI conventions

Convention	Description
Boldface	Window names, button names, field names, and menu items are in bold text. For example, the **New User** window appears; click **OK**.
>	Multi-level menus are separated by angle brackets. For example, **File** > **Create** > **Folder**.

Symbols

Convention	Description
WARNING	An alert that calls attention to important information that if not understood or followed can result in personal injury.
CAUTION	An alert that calls attention to important information that if not understood or followed can result in data loss, data corruption, or damage to hardware or software.
IMPORTANT	An alert that calls attention to essential information.
NOTE	An alert that contains additional or supplementary information.
TIP	An alert that provides helpful information.

Network topology icons

	Represents a generic network device, such as a router, switch, or firewall.
	Represents a routing-capable device, such as a router or Layer 3 switch.
	Represents a generic switch, such as a Layer 2 or Layer 3 switch, or a router that supports Layer 2 forwarding and other Layer 2 features.
	Represents an access controller, a unified wired-WLAN module, or the switching engine on a unified wired-WLAN switch.
	Represents an access point.
	Represents a security product, such as a firewall, a UTM, or a load-balancing or security card that is installed in a device.
	Represents a security card, such as a firewall card, a load-balancing card, or a NetStream card.

Port numbering in examples

The port numbers in this document are for illustration only and might be unavailable on your device.

Appendix A Chassis views and technical specifications

Chassis views

Every 7500 switch chassis has an MPU section, LPU section, power supply section, and fan assembly section. Figure 54 uses the 7503 switch as an example.

Figure 54 Front view of the 7503

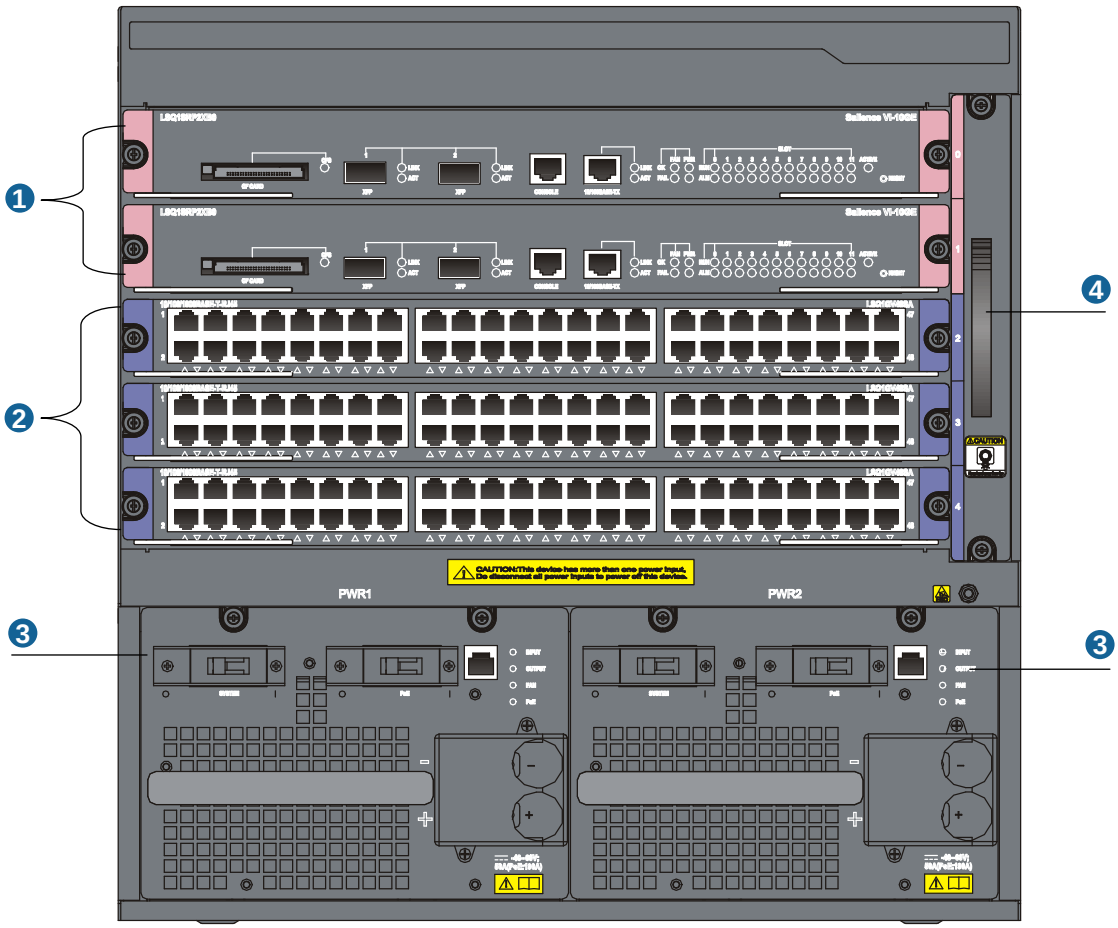


Table 25 Chassis structure

Section	Description	Ordering remarks
(1) MPU slots	Both MPUs and MPU slots are pink edged for easy identification. An MPU is the supervisor and control engine and switching fabric for the switches.	You must order MPUs as needed, and install at least one MPU. You can install two MPUs (for active and standby switchover) for all 7500 switches except the 7503-S.

Section	Description	Ordering remarks
(2) LPU slots	Both LPU slots and LPUs are purple edged for easy identification. The LPUs are interface cards that provide network services, including receiving and forwarding traffic.	You must order LPUs as needed and install at least one LPU.
(3) Power supply slots	N/A	You must order power supplies as needed and install at least one power supply. You can also install two power supplies for redundancy.
(4) Fan assembly slot	Location of the fan tray slot: • **7506-V**—Top front of the chassis • **Other 7500 switches**—Right front of the chassis	Every 7500 switch comes with one fan assembly. You do not need to order fan assemblies.

Switch and FRU aliases

The following tables list the aliases of the 7500 switches and FRUs in this installation guide:

- Table 26 for 7500 switch chassis
- Table 27 for MPUs
- Table 28 for LPUs
- Table 29 for power supplies
- Table 32 for PoE DIMMs
- Table 33 for fan assemblies
- Table 34 for CF cards

Table 26 HP 7500 Switch Series

Product code	Description	Alias
JD242B	HP 7502 Switch Chassis	7502
JD243B	HP 7503-S Switch Chassis	7503-S
JD240B	HP 7503 Switch Chassis	7503
JD239B	HP 7506 Switch Chassis	7506
JD241B	HP 7506-V Switch Chassis	7506-V
JD238B	HP 7510 Switch Chassis	7510

Table 27 MPU models

Product code	Description	Alias
JD196A	HP 7502 Main Processing Unit	LSQ1MPUA0
JC697A	HP 7502 TAA-compliant Main Processing Unit	
JD220A	HP 7510 768 Gbps Fabric / Main Processing Unit	LSQ1SRPD0
JC701A	HP 7510 768 Gbps TAA-compliant Fabric / Main Processing Unit	

Product code	Description	Alias
JD222A	HP 7503-S 144 Gbps Fabric / Main Processing Unit with 16 GbE SFP Ports and 8 GbE Combo Ports	LSQ1CGP24TSC0
JC698A	HP 7503-S 144 Gbps TAA Fabric / Main Processing Unit with 16 GbE SFP Ports and 8 GbE Combo Ports	
JD193B	HP 7500 384 Gbps Fabric / Main Processing Unit with 2 10-GbE XFP Ports	LSQ1SRP2XB0
JC699A	HP 7500 384 Gbps TAA-compliant Fabric / Main Processing Unit with 2 10-GbE XFP Ports	
JD194B	HP 7500 384 Gbps Fabric / Main Processing Unit	LSQ1SRPB0
JC700A	HP 7500 384 Gbps TAA-compliant Fabric / Main Processing Unit	
JD195A	HP 7500 384 Gbps Fabric / Advanced Main Processing Unit	LSQ1SRP1CB0
JC666A	HP 7503-S 144 Gbps Fabric / Main Processing Unit with PoE-upgradable 20p Gig-T / 4p GbE Combo	LSQ1CGV24PSC0

Table 28 LPU models

Product code	Description	Alias
JD197B	HP 7500 48-port 100Base-FX SA Module	LSQ1FP48SA0
JD198B	HP 7500 48-port 10/100Base-TX PoE-upgradable SA Module	LSQ1FV48SA0
JD199B	HP 7500 48-port Gig-T PoE-upgradable SA Module	LSQ1GV48SA0
JC667A	HP 7500 16-port GbE SFP / 8-port GbE Combo SA Module	LSQ1GP24TSA0
JC668A	HP 7500 20-port Gig-T / 4-port GbE PoE-upgradable Combo SA Module	LSQ1GV24PSA0
JD201A	HP 7500 2-port 10-GbE XFP SC Module	LSQ1TGX2SC0
JD203B	HP 7500 24-port GbE SFP SC Module	LSQ1GP24SC0
JC704A	HP 7500 24-port GbE SFP SC TAA-compliant Module	
JD204B	HP 7500 24-port Gig-T SC Module	LSQ1GT24SC0
JD205A	HP 7500 24-port GbE SFP / 2-port 10-GbE XFP SC Module	LSQ1P24XGSC0
JD206A	HP 7500 24-port Gig-T / 2-port 10-GbE XFP SC Module	LSQ1T24XGSC0
JD207A	HP 7500 12-port GbE SFP SC Module	LSQ1GP12SC0
JD210A	HP 7500 48-port Gig-T PoE-upgradable SC Module	LSQ1GV48SC0
JC709A	HP 7500 48-port Gig-T PoE-upgradable SC TAA-compliant Module	
JG663A	HP 7500 48-port 1000BASE-T PoE+ SC Module	LSQ3GV48SC0
JG664A	HP 7500 48-port 1000BASE-T PoE+ SC TAA-compliant Module	
JD228B	HP 7500 40-port Gig-T / 8-port GbE SFP PoE-upgradable SC Module	LSQ1GV40PSC0
JC710A	HP 7500 40-port Gig-T / 8-port GbE SFP PoE-upgradable SC TAA-compliant Module	
JD223A	HP 7500 16-port GbE SFP / 8-port GbE Combo SC Module	LSQ1GP24TSC0
JD211B	HP 7500 48-port GbE SFP SC Module	LSQ1GP48SC0

Product code	Description	Alias
JF290A	HP 7500 8-port 10-GbE SFP+ SC Module	LSQ1TGS8SC0
JC723A	HP 7500 8-port 10-GbE SFP+ SC TAA-compliant Module	
JC669A	HP 7500 20-port Gig-T / 4-port GbE Combo PoE-upgradable SC Module	LSQ1GV24PSC0
JC792A	HP 7500 4-port 40GbE QSFP+ SC Module	LSQ1QGS4SC0
JG373A	HP 7500 4-port 40GbE CFP SC Module	LSQ1QGC4SC0
JD191A	HP 7500 8-port 10-GbE XFP SD Module	LSQ1TGX8SD0
JC713A	HP 7500 8-port 10-GbE XFP SD TAA-compliant Module	
JD229B	HP 7500 48-port Gig-T PoE+ SD Module	LSQ1GV48SD0
JC712A	HP 7500 48-port Gig-T PoE+ SD TAA-compliant Module	
JD230A	HP 7500 24-port GbE SFP / 2-port 10-GbE XFP SD Module	LSQ1GP24TXSD0
JC714A	HP 7500 24-port GbE SFP / 2-port 10-GbE XFP SD TAA-compliant Module	
JD236A	HP 7500 2-port 10-GbE XFP SD Module	LSQ1TGX2SD0
JD234A	HP 7500 16-port GbE SFP / 8-port GbE Combo SD Module	LSQ1GP24TSD0
JC718A	HP 7500 16-port GbE SFP / 8-port GbE Combo SD TAA-compliant Module	
JD235A	HP 7500 4-port 10-GbE XFP SD Module	LSQ1TGX4SD0
JC719A	HP 7500 4-port 10-GbE XFP SD TAA-compliant Module	
JD237A	HP 7500 48-port GbE SFP SD Module	LSQ1GP48SD0
JC721A	HP 7500 48-port GbE SFP SD TAA-compliant Module	
JD221A	HP 7500 48-port GbE SFP EB Module	LSQ1GP48EB0
JD231A	HP 7500 16-port GbE SFP / 8-port GbE Combo EB Module	LSQ1GP24TEB0
JC715A	HP 7500 16-port GbE SFP / 8-port GbE Combo EB TAA-compliant Module	
JD232A	HP 7500 4-port 10-GbE XFP EB Module	LSQ1TGX4EB0
JC716A	HP 7500 4-port 10-GbE XFP EB TAA-compliant Module	
JD233A	HP 7500 2-port 10-GbE XFP EB Module	LSQ1TGX2EB0
JG639A	HP 10500/7500 20G Unified Wired-WLAN Module	LSU3WCMD0
JG645A	HP 10500/7500 20G Unified Wired-WLAN TAA-compliant Module	
JG372A	HP 10500/11900/7500 20Gbps VPN Firewall module	LSU1FWCEA0
JD249A	HP 7500 VPN Firewall Module	LSQ1FWBSC0
JD252A	HP 7500 Load Balancing Module	LSQ1LBSC0
JD254A	HP 7500 NetStream Monitoring Module	LSQ1NSMSC0
JD253A	HP 7500 SSL VPN Module with 500-user License	LSQ1SSLSC0

Table 29 Power supply models

Product code	Description	Alias
JD218A	HP 7500 1400W AC Power Supply	1400W AC
JD208A	HP 7500 1400W DC Power Supply	1400W DC
JD217A	HP 7500 650W AC Power Supply	650W AC
JD209A	HP 7500 650W DC Power Supply	650W DC
JD226A	HP 7502 300W AC Power Supply	300W AC
JD225A	HP 7502 300W DC Power Supply	300W DC
JD219A	HP 7500 2800W AC Power Supply	2800W AC
JD227A	HP 7500 6000W AC Power Supply	6000W AC

Table 30 Mounting accessories

Product code	Description	Alias
JC665A	HP X421 A-Series Chassis Universal 4-Post Rack Mounting Kit	Rack Mounting Kit

Table 31 DC cables

Product code	Description	Alias
JG332A	HP X290 14-pin Mini-Fit to 2 x OT Copper Lug 1m RPS Power Cable	RPS Power Cable
JG333A	HP X210 JG2 to T50 3m DC (2) Power Cables	DC Power Cables

Table 32 PoE DIMM models

Product code	Description	Alias
JD192B	HP 7500 48-port PoE DIMM	48-port PoE DIMM
JC671A	HP 7500 24-port PoE DIMM	24-port PoE DIMM

Table 33 Fan assembly models

Product code	Description	Alias
JD212A	HP 7503 Spare Fan Assembly	7503 Fan
JD213A	HP 7502 Spare Fan Assembly	7502 Fan
JD214A	HP 7506 Spare Fan Assembly	7506 Fan
JD215A	HP 7506-V Spare Fan Assembly	7506-V Fan
JD216A	HP 7510 Spare Fan Assembly	7510 Fan
JC672A	HP 7503-S Spare Fan Assembly	7503-S Fan

Table 34 CF card models

Product code	Description	Alias
JC686A	HP X600 256M Compact Flash Card	CF-256M-I
JC685A	HP X600 512M Compact Flash Card	CF-512M
JC684A	HP X600 1G Compact Flash Card	CF-1G

Weights and dimensions

Table 35 Chassis weights and dimensions

Model	Weight	Dimensions		
		Height	Width	Depth
7502	< 15 kg (33.07 lb)	175 mm (6.89 in) (4 RU)	436 mm (17.17 in)	420 mm (16.54 in)
7503-S	< 15 kg (33.07 lb)	175 mm (6.89 in) (4 RU)	436 mm (17.17 in)	420 mm (16.54 in)
7503	< 30 kg (66.14 lb)	441 mm (17.36 in) (10 RU)	436 mm (17.17 in)	420 mm (16.54 in)
7506	< 40 kg (88.18 lb)	575 mm (22.64 in) (13 RU)	436 mm (17.17 in)	420 mm (16.54 in)
7510	< 45 kg (99.21 lb)	708 mm (27.87 in) (16 RU)	436 mm (17.17 in)	420 mm (16.54 in)
7506-V	< 50 kg (110.23 lb)	930 mm (36.61 in) (21 RU)	436 mm (17.17 in)	420 mm (16.54 in)

NOTE:

A rack unit (RU) is a measurement of the height of a rack. 1 RU is 44.45 mm (1.75 in).

Table 36 Card weights and dimensions

Card model	Weight	Dimensions		
		Height	Width	Depth
LSQ1MPUA0	1.35 kg (2.98 lb)	45 mm (1.77 in)	199 mm (7.83 in)	352 mm (13.86 in)
LSQ1CGP24TSC0	2.8 kg (6.18 lb)	45 mm (1.77 in)	399 mm (15.71 in)	352 mm (13.86 in)
LSQ1CGV24PSC0	2.86 kg (6.31 lb)	45 mm (1.77 in)	399 mm (15.71 in)	352 mm (13.86 in)
LSQ1SRPB0 (Salience VI)	3.6 kg (7.94 lb)	45 mm (1.77 in)	399 mm (15.71 in)	352 mm (13.86 in)
LSQ1SRPD0 (Salience VI-Plus)	3.56 kg (7.85 lb)	45 mm (1.77 in)	399 mm (15.71 in)	352 mm (13.86 in)
LSQ1SRP1CB0 (Salience VI-Turbo)	3.6 kg (7.94 lb)	45 mm (1.77 in)	399 mm (15.71 in)	352 mm (13.86 in)
LSQ1SRP2XB0 (Salience VI-10GE)	3.6 kg (7.94 lb)	45 mm (1.77 in)	399 mm (15.71 in)	352 mm (13.86 in)
LSQ1FP48SA0	3.05 kg (6.72 lb)	40 mm (1.57 in)	399 mm (15.71 in)	352 mm (13.86 in)
LSQ1FV48SA0	2.89 kg (6.37 lb)	40 mm (1.57 in)	399 mm (15.71 in)	352 mm (13.86 in)
LSQ1GP24TSA0	2.77 kg (6.11 lb)	40 mm (1.57 in)	399 mm (15.71 in)	352 mm (13.86 in)

Card model	Weight	Dimensions		
		Height	Width	Depth
LSQ1GV24PSA0	2.8 kg (6.17 lb)	40 mm (1.57 in)	399 mm (15.71 in)	352 mm (13.86 in)
LSQ1GV48SA0	3.09 kg (6.81 lb)	40 mm (1.57 in)	399 mm (15.71 in)	352 mm (13.86 in)
LSQ1GP12SC0	2.66 kg (5.86 lb)	40 mm (1.57 in)	399 mm (15.71 in)	352 mm (13.86 in)
LSQ1GP24SC0	2.78 kg (6.13 lb)	40 mm (1.57 in)	399 mm (15.71 in)	352 mm (13.86 in)
LSQ1GP48SC0	3.04 kg (6.70 lb)	40 mm (1.57 in)	399 mm (15.71 in)	352 mm (13.86 in)
LSQ1GT24SC0	2.72 kg (5.60 lb)	40 mm (1.57 in)	399 mm (15.71 in)	352 mm (13.86 in)
LSQ1GP24TSC0	2.77 kg (6.11 lb)	40 mm (1.57 in)	399 mm (15.71 in)	352 mm (13.86 in)
LSQ1GV48SC0	3.09 kg (6.81 lb)	40 mm (1.57 in)	399 mm (15.71 in)	352 mm (13.86 in)
LSQ3GV48SC0	3.31 kg (7.30 lb)	40 mm (1.57 in)	399 mm (15.71 in)	352 mm (13.86 in)
LSQ1TGS8SC0	3.11 kg (6.86 lb)	40 mm (1.57 in)	399 mm (15.71 in)	352 mm (13.86 in)
LSQ1TGX2SC0	2.95 kg (6.50 lb)	40 mm (1.57 in)	399 mm (15.71 in)	352 mm (13.86 in)
LSQ1GV24PSC0	2.8 kg (6.17 lb)	40 mm (1.57 in)	399 mm (15.71 in)	352 mm (13.86 in)
LSQ1P24XGSC0	2.95 kg (6.50 lb)	40 mm (1.57 in)	399 mm (15.71 in)	352 mm (13.86 in)
LSQ1T24XGSC0	2.92 kg (6.44 lb)	40 mm (1.57 in)	399 mm (15.71 in)	352 mm (13.86 in)
LSQ1GV40PSC0	3.02 kg (6.66 lb)	40 mm (1.57 in)	399 mm (15.71 in)	352 mm (13.86 in)
LSQ1QGS4SC0	3.12 kg (6.88 lb)	40 mm (1.57 in)	399 mm (15.71 in)	352 mm (13.86 in)
LSQ1QGC4SC0	3.46 kg (7.62 lb)	40 mm (1.57 in)	399 mm (15.71 in)	352 mm (13.86 in)
LSQ1GP24TSD0	3.01 kg (6.64 lb)	40 mm (1.57 in)	399 mm (15.71 in)	352 mm (13.86 in)
LSQ1GP24TXSD0	3.08 kg (6.79 lb)	40 mm (1.57 in)	399 mm (15.71 in)	352 mm (13.86 in)
LSQ1GP48SD0	3.25 kg (7.16 lb)	40 mm (1.57 in)	399 mm (15.71 in)	352 mm (13.86 in)
LSQ1GV48SD0	3.31 kg (7.30 lb)	40 mm (1.57 in)	399 mm (15.71 in)	352 mm (13.86 in)
LSQ1TGX2SD0	2.93 kg (6.46 lb)	40 mm (1.57 in)	399 mm (15.71 in)	352 mm (13.86 in)
LSQ1TGX4SD0	2.93 kg (6.46 lb)	40 mm (1.57 in)	399 mm (15.71 in)	352 mm (13.86 in)
LSQ1TGX8SD0	3.23 kg (7.12 lb)	40 mm (1.57 in)	399 mm (15.71 in)	352 mm (13.86 in)
LSQ1GP24TEB0	3.04 kg (6.70 lb)	40 mm (1.57 in)	399 mm (15.71 in)	352 mm (13.86 in)
LSQ1GP48EB0	3.25 kg (7.16 lb)	40 mm (1.57 in)	399 mm (15.71 in)	352 mm (13.86 in)
LSQ1TGX2EB0	2.93 kg (6.46 lb)	40 mm (1.57 in)	399 mm (15.71 in)	352 mm (13.86 in)
LSQ1TGX4EB0	2.93 kg (6.46 lb)	40 mm (1.57 in)	399 mm (15.71 in)	352 mm (13.86 in)
LSU3WCMD0	3.62 kg (7.98 lb)	40 mm (1.57 in)	399 mm (15.71 in)	352 mm (13.86 in)
LSU1FWCEA0	3.9 kg (8.60 lb)	40 mm (1.57 in)	399 mm (15.71 in)	352 mm (13.86 in)
LSQ1FWBSC0	3.23 kg (7.12 lb)	40 mm (1.57 in)	399 mm (15.71 in)	352 mm (13.86 in)
LSQ1LBSC0	3.23 kg (7.12 lb)	40 mm (1.57 in)	399 mm (15.71 in)	352 mm (13.86 in)
LSQ1NSMSC0	3.23 kg (7.12 lb)	40 mm (1.57 in)	399 mm (15.71 in)	352 mm (13.86 in)
LSQ1SSLSC0	3.1 kg (6.83 lb)	40 mm (1.57 in)	399 mm (15.71 in)	352 mm (13.86 in)

NOTE:

The dimensions of the cards are measured as follows:

- **H**—Height of the card front panel
- **W**—Width of the card front panel
- **D**—Depth from the card front panel to the connector

Table 37 Power supply weights and dimensions

Model	Weight	Dimensions		
		Height	Width	Depth
300W AC	1.9 kg (4.19 lb)	40 mm (1.57 in)	140 mm (5.51 in)	350 mm (13.78 in)
300W DC	1.9 kg (4.19 lb)	40 mm (1.57 in)	140 mm (5.51 in)	350 mm (13.78 in)
650W AC	2.5 kg (5.51 lb)	40 mm (1.57 in)	140 mm (5.51 in)	350 mm (13.78 in)
650W DC	2.3 kg (5.07 lb)	40 mm (1.57 in)	140 mm (5.51 in)	350 mm (13.78 in)
1400W AC	8.3 kg (18.30 lb)	128 mm (5.04 in)	196 mm (7.72 in)	380 mm (14.96 in)
1400W DC	9.3 kg (20.50 lb)	128 mm (5.04 in)	196 mm (7.72 in)	380 mm (14.96 in)
2800W AC	9.9 kg (21.83 lb)	128 mm (5.04 in)	196 mm (7.72 in)	380 mm (14.96 in)
6000W AC	12.2 kg (26.90 lb)	128 mm (5.04 in)	196 mm (7.72 in)	380 mm (14.96 in)

Table 38 Fan assembly weights and dimensions

Fan assembly	Weight	Dimensions		
		Height	Width	Depth
7502 fan assembly	0.9 kg (1.98 lb)	27 mm (1.06 in)	115 mm (4.53 in)	338 mm (13.31 in)
7503-S fan assembly	0.9 kg (1.98 lb)	27 mm (1.06 in)	115 mm (4.53 in)	338 mm (13.31 in)
7503 fan assembly	1.6 kg (3.53 lb)	27 mm (1.06 in)	203 mm (7.99 in)	365 mm (14.37 in)
7506 fan assembly	2.2 kg (4.85 lb)	28 mm (1.10 in)	331 mm (13.03 in)	365 mm (14.37 in)
7506-V fan assembly	3.2 kg (7.05 lb)	45 mm (1.77 in)	375 mm (14.76 in)	369 mm (14.53 in)
7510 fan assembly	3.0 kg (6.61 lb)	28 mm (1.10 in)	497 mm (19.57 in)	380 mm (14.96 in)

Module power consumption and total power consumption

Total power consumption

The total power consumption is the system power consumption plus PoE power consumption.

- The system power consumption is the sum of the power consumption of all running cards and the power consumption of all fans.
- The PoE power consumption is the sum of the power consumption of all PDs connected to the switch.

Card power consumption

The power consumption of the cards of the 7500 Switch Series depends on the card model and state. Table 39 shows the power consumption for different card models.

- The static power consumption of a card refers to the power consumed by the card when the card is running but all ports on the card are down and when no transceiver module is available on the fiber interface of the card.
- The dynamic power consumption of a card refers to the power consumed by the card when all the ports on the card are link up and send broadcasts.

Fan assembly power consumption

The 7500 Switch Series except the 7503-S uses fan assemblies that can automatically adapt the fan rotating speed to the heat output. The power consumed by a fan assembly depends on the fan speed. Table 40 shows the power consumption of different fan assemblies.

System power consumption

The system power consumption of an HP 7500 switch depends on the type and number of cards and the fan assembly power consumption.

- The minimum system power consumption is the total static power consumption of all cards plus the minimum fan assembly power consumption. For example, for an HP 7503 switch that has two LSQ1SRPB0 main processing units (MPUs), three LSQ1GV48SC0 line processing units (LPUs), and one fan assembly, the minimum system power consumption of the switch is 2 × 42 + 3 × 60 + 15.5 = 279.5 W.
- The maximum system power consumption is the total dynamic power consumption of all cards plus the maximum fan assembly power consumption. For example, for an HP 7503 switch that has two LSQ1SRPB0 MPUs, three LSQ1GV48SC0 LPUs, and one fan assembly, the maximum system power consumption of the switch is 2 × 50 + 3 × 90 +27.5 = 397.5 W.

PoE power consumption

The maximum PoE power consumption depends on the type and number of PoE cards, PoE power supply mode supported by each PoE card, and the number of ports that support PoE. For example, if an HP 7503 switch has one LSQ1GV40PSC0, two LSQ1GV24PSC, and the MPU does not support PoE, the maximum PoE power consumption of the switch is 40 × 15.4 + 2 × 24 × 15.4 = 1355.2 W.

NOTE:

- The PoE power consumption is 0 if the switch does not supply PoE power.
- The maximum PoE power consumption refers to the sum of the power consumption of all PDs when all ports supporting PoE are connected to PDs, and the maximum output power is reached.
- For more information about PoE power supply, see "Installing FRUs."

Card power consumption

Table 39 Card power consumption

Model	Minimum static power consumption	Maximum dynamic power consumption
LSQ1MPUA0	10 W	15 W
LSQ1CGP24TSC0	25 W	45 W
LSQ1CGV24PSC0	30 W	60 W
LSQ1SRPB0 (Salience VI)	42 W	50 W
LSQ1SRPD0 (Salience VI-Plus)	50 W	60 W
LSQ1SRP1CB0 (Salience VI-Turbo)	53 W	60 W
LSQ1SRP2XB0 (Salience VI-10GE)	55 W	65 W
LSQ1FP48SA0	34 W	85 W
LSQ1FV48SA0	30 W	35 W
LSQ1GP24TSA0	25 W	45 W
LSQ1GV24PSA0	30 W	60 W
LSQ1GV48SA0	60 W	80 W
LSQ1GP12SC0	26 W	35 W
LSQ1GP24SC0	38 W	55 W
LSQ1GP48SC0	43 W	85 W
LSQ1GP24TSC0	25 W	45 W
LSQ1GT24SC0	42 W	50 W
LSQ1GV48SC0	60 W	90 W
LSQ3GV48SC0	67 W	95 W
LSQ1TGS8SC0	75 W	95 W
LSQ1TGX2SC0	30 W	40 W
LSQ1GV24PSC0	30 W	60 W
LSQ1P24XGSC0	40 W	55 W
LSQ1T24XGSC0	50 W	75 W
LSQ1GV40PSC0	41 W	95 W
LSQ1QGS4SC0	70 W	90 W

Model	Minimum static power consumption	Maximum dynamic power consumption
LSQ1QGC4SC0	52 W	85 W
LSQ1GP24TSD0	47 W	75 W
LSQ1GP24TXSD0	54 W	95 W
LSQ1GP48SD0	44 W	95 W
LSQ1GV48SD0	67 W	95 W
LSQ1TGX2SD0	43 W	55 W
LSQ1TGX4SD0	53 W	80 W
LSQ1TGX8SD0	73 W	120 W
LSQ1GP24TEB0	50 W	90 W
LSQ1GP48EB0	43 W	110 W
LSQ1TGX2EB0	46 W	65 W
LSQ1TGX4EB0	53 W	80 W
LSU3WCMD0	118 W	150 W
LSU1FWCEA0	109 W	157 W
LSQ1FWBSC0	80 W	107 W
LSQ1LBSC0	80 W	107 W
LSQ1NSMSC0	80 W	104W
LSQ1SSLSC0	80 W	100W

Fan assembly power consumption

Table 40 Fan assembly power consumption

Model	Minimum fan assembly power consumption	Maximum fan assembly power consumption
7502	7.5 W	14.5 W
7503-S	14.5 W	14.5 W
7503	15.5 W	27.5 W
7506	24.5 W	42.5 W
7510	28 W	48.5 W
7506-V	30 W	45.5 W

Thermal output

The thermal output of the switch depends on power consumption. To calculate thermal output of the switch, assume 90% power consumption is converted to heat, and the efficiency of the power supply is

80%. Thermal output/hour of the switch is 0.9 × (total power consumption of the cards plus power consumption of the fan assembly)/0.8 × 3.4121.

NOTE:

- For the power consumption of the cards and fan assemblies of the 7500 Switch Series, see "Module power consumption and total power consumption."
- Thermal output is measured in the unit of BTU/h. 1 W = 3.4121BTU/h.

Environmental specifications

Table 41 Environmental specifications for the 7500 Switch Series

Description	Operating	Nonoperating
Temperature	0°C to 45°C (32°F to 113°F)	–40°C to +70°C (–40°F to +158°F)
Relative humidity	10% to 95% (non-condensing)	5% to 95% (non-condensing)

Noise

The 7500 Switch Series adopts different types of fan assemblies. The 7503-S adopts fans with a fixed speed (the fan speed does not change with the thermal output), so the sound pressure level of the switch is fixed. The other models adopt fans with the automatic speed adjustment function, so the sound pressure levels are different when the fan speeds are different. For more information, see Table 42.

Table 42 7500 sound pressure levels

Model	Sound pressure level when the fan assembly operates at low speed	Sound pressure level when the fan assembly operates at middle speed	Sound pressure level when the fan assembly operates at full speed
7502	49.8 dBA	51.6 dBA	56.7 dBA
7503-S	N/A	N/A	56.7 dBA
7503	51.6 dBA	54.6 dBA	56.1 dBA
7506	53.6 dBA	56.2 dBA	57.7 dBA
7510	53.5 dBA	55.8 dBA	56.7 dBA
7506-V	52.1 dBA	55.1 dBA	56.2 dBA

Appendix B FRUs and compatibility matrixes

NOTE:

In the compatibility matrixes in this appendix, a solid dot (●) represents compatible and a dash (—) represents incompatible.

MPUs

MPUs are the supervisor engines that manage and control the operations of a switch. The MPUs for the 7500 switches also work as switching fabrics.

You can install up to two MPUs on an HP 7500 switch except the 7503-S, and the MPUs must be the same model.

Table 43 describes the MPUs available for the 7500 switches, and Table 44 describes the MPU and switch chassis compatibility.

Table 43 MPUs available for the 7500 switches

MPU	Console ports	Management Ethernet ports (10/100BASE-TX)	CF card slots	Other ports
LSQ1MPUA0	1	1	1	N/A
LSQ1CGV24PSC0	1	1	N/A	• 20 × 10/100/1000Base-T Ethernet ports (RJ-45) • 4 × combo interfaces
LSQ1CGP24TSC0	1	1	N/A	• 16 × Gigabit/100-Mbps SFP ports (LC) • 8 × combo interfaces
LSQ1SRPB0 (Salience VI)	1	1	1	N/A
LSQ1SRPD0 (Salience VI-Plus)	1	1	1	N/A
LSQ1SRP1CB0 (Salience VI-Turbo)	1	1	1	N/A
LSQ1SRP2XB0 (Salience VI-10GE)	1	1	1	2 × 10-Gigabit XFP ports (LC)

NOTE:

A combo interface has one SFP port and one RJ-45 Ethernet port. These two ports cannot work simultaneously. When you activate one port (by using the **undo shutdown** command), the other port automatically shuts down. By default, the lower numbered port is active.

Table 44 MPU and 7500 switch chassis compatibility matrix

MPU	7502	7503-S	7503	7506	7510	7506-V
LSQ1MPUA0	●	—	—	—	—	—
LSQ1CGP24TSC0	—	●	—	—	—	—
LSQ1CGV24PSC0	—	●	—	—	—	—
LSQ1SRPB0 (Salience VI)	—	—	●	●	●	●
LSQ1SRPD0 (Salience VI-Plus)	—	—	●	●	●	●
LSQ1SRP1CB0 (Salience VI-Turbo)	—	—	●	●	●	●
LSQ1SRP2XB0 (Salience VI-10GE)	—	—	●	●	●	●

LPUs

Table 45 LPUs available for the 7500 switches

LPU	Description	Connector	Number of interfaces	Interface transmission rate	Available transceiver modules
LSQ1FP48SA0	48-port 100-Mbps optical Ethernet interface card (SFP, LC)	LC	48	100 Mbps	100-Mbps SFP module
LSQ1FV48SA0	48-port 100-Mbps electrical Ethernet interface card (RJ-45)-PoE	RJ-45	48	10/100 Mbps, half/full-duplex	N/A
LSQ1GP24TSA0	16-port Gigabit optical Ethernet interface (SFP, LC) + 8-port Gigabit combo interface card	LC	24	1000/100 Mbps	• Gigabit SFP module • 100-Mbps SFP module
		RJ-45	8	10/100/1000 Mbps, half/full-duplex	N/A
LSQ1GV24PSA0	20-port Gigabit electrical interface (RJ-45) + 4-port Gigabit Combo interface card-PoE	RJ-45	24	10/100/1000 Mbps, half/full-duplex	N/A
		LC	4	1000/100 Mbps	• Gigabit SFP module • 100-Mbps SFP module

LPU	Description	Connector	Number of interfaces	Interface transmission rate	Available transceiver modules
LSQ1GV48SA0	48-port Gigabit electrical Ethernet interface card (RJ-45)-PoE	RJ-45	48	10/100/1000 Mbps, half/full-duplex	N/A
LSQ1GP12SC0	12-port Gigabit optical Ethernet interface card (SFP, LC)	LC	12	1000/100 Mbps	• Gigabit SFP module • 100-Mbps SFP module
LSQ1GP24SC0	24-port Gigabit optical Ethernet interface card (SFP, LC)	LC	24	1000/100 Mbps	• Gigabit SFP module • 100-Mbps SFP module
LSQ1GP48SC0	48-port Gigabit optical Ethernet interface card (SFP, LC)	LC	48	1000/100Mbit/s	• Gigabit SFP module • 100-Mbps SFP module
LSQ1GP24TSC0	16-port Gigabit optical Ethernet interface (SFP, LC) + 8-port Gigabit combo interface card	LC	24	1000/100 Mbps	• Gigabit SFP module • 100-Mbps SFP module
		RJ-45	8	10/100/1000 Mbps, half/full-duplex	N/A
LSQ1GT24SC0	24-port Gigabit electrical Ethernet interface card (RJ-45)	RJ-45	24	10/100/1000 Mbps, half/full-duplex	N/A
LSQ1GV48SC0	48-port Gigabit electrical Ethernet interface card (RJ-45)-PoE	RJ-45	48	10/100/1000 Mbps, half/full-duplex	N/A
LSQ3GV48SC0	48-port Gigabit electrical Ethernet interface card (RJ-45)-PoE Plus	RJ-45	48	10/100/1000 Mbps, half/full-duplex	N/A
LSQ1TGS8SC0	8-port 10-Gigabit optical SFP+ interface card	LC	8	10 Gbps	• 10-Gigabit SFP+ module • 10-Gigabit SFP+ cable
LSQ1TGX2SC0	2-port 10-Gigabit optical Ethernet interface card (XFP, LC)	LC	2	10 Gbps	10-Gigabit XFP module

LPU	Description	Connector	Number of interfaces	Interface transmission rate	Available transceiver modules
LSQ1GV24PSC0	20-port Gigabit electrical interface (RJ-45) + 4-port Gigabit Combo interface card-PoE	RJ-45	24	10/100/1000 Mbps, half/full-duplex	N/A
		LC	4	1000/100 Mbps	• Gigabit SFP module • 100-Mbps SFP module
LSQ1P24XGSC0	24-port Gigabit optical interface (SFP, LC) +2-port 10-Gigabit optical interface (XFP, LC) card	LC	24	1000/100 Mbps	• Gigabit SFP module • 100-Mbps SFP module
			2	10 Gbps	10-Gigabit XFP module
LSQ1T24XGSC0	24-port Gigabit electrical interface (RJ-45) +2-port 10-Gigabit optical interface (XFP, LC) card	RJ-45	24	10/100/1000 Mbps, half/full-duplex	N/A
		LC	2	10 Gbps	10-Gigabit XFP module
LSQ1GV40PSC0	40-port Gigabit electrical interface (RJ-45) +8-port Gigabit optical interface (SFP, LC) card	RJ-45	40	10/100/1000 Mbps, half/full-duplex	N/A
		LC	8	1000/100 Mbps	• Gigabit SFP module • 100-Mbps SFP module
LSQ1QGS4SC0	4-port 40-G optical Ethernet interface (QSFP+, MPO) card	MPO	4	40 Gbps	• QSFP+ module • QSFP+ cable • QSFP+ to SFP+ cable
LSQ1QGC4SC0	4-port 40-G optical interface (CFP) card	LC	4	40 Gbps	• CFP module
LSQ1GP24TSD0	16-port Gigabit optical Ethernet interface (SFP, LC) + 8-port Gigabit combo interface card	LC	24	1000/100 Mbps	• Gigabit SFP module • 100-Mbps SFP module
		RJ-45	8	10/100/1000 Mbps, half/full-duplex	N/A

LPU	Description	Connector	Number of interfaces	Interface transmission rate	Available transceiver modules
LSQ1GP24TXSD0	16-port Gigabit optical Ethernet interface (SFP, LC) + 8-port Gigabit combo interface + 2-port 10-Gigabit optical interface (XFP, LC) card	LC	24	1000/100 Mbps	• Gigabit SFP module • 100-Mbps SFP module
			2	10 Gbps	10-Gigabit XFP module
		RJ-45	8	10/100/1000 Mbps, half/full-duplex	N/A
LSQ1GP48SD0	48-port Gigabit optical Ethernet interface card (SFP, LC)	LC	48	1000/100 Mbps	• Gigabit SFP module • 100-Mbps SFP module
LSQ1GV48SD0	48-port Gigabit electrical Ethernet interface card (RJ-45)-PoE Plus	RJ-45	48	10/100/1000 Mbps, half/full-duplex	N/A
LSQ1TGX2SD0	2-port 10-Gigabit optical Ethernet interface card (XFP, LC)	LC	2	10 Gbps	10-Gigabit XFP module
LSQ1TGX4SD0	4-port 10-Gigabit optical Ethernet interface card (XFP, LC)	LC	4	10 Gbps	10-Gigabit XFP module
LSQ1TGX8SD0	8-port 10-Gigabit optical Ethernet interface card (XFP, LC)	LC	8	10 Gbps	10-Gigabit XFP module
LSQ1GP24TEB0	16-port Gigabit optical Ethernet interface (SFP, LC) + 8-port Gigabit combo interface card	LC	24	1000/100 Mbps	• Gigabit SFP module • 100-Mbps SFP module
		RJ-45	8	10/100/1000 Mbps, half/full-duplex	N/A
LSQ1GP48EB0	48-port enhanced Gigabit optical Ethernet interface card (SFP, LC)	LC	48	1000/100 Mbps	• Gigabit SFP module • 100-Mbps SFP module
LSQ1TGX2EB0	2-port 10-Gigabit optical Ethernet interface card (XFP, LC)	LC	2	10 Gbps	10-Gigabit XFP module

LPU	Description	Connector	Number of interfaces	Interface transmission rate	Available transceiver modules
LSQ1TGX4EB0	4-port 10-Gigabit optical Ethernet interface card (XFP, LC)	LC	4	10 Gbps	10-Gigabit XFP module
LSU3WCMD0	HP 10500/7500 20G Unified Wired-WLAN Module	RJ-45	One console port	No greater than 115200 bps and defaults to 9600 bps	N/A
			One 10/100/1000Base-T management Ethernet port	10/100/1000 Mbps, half/full duplex	
LSU1FWCEA0	HP 10500/11900/7500 20Gbps VPN Firewall module	RJ-45	One console port	No greater than 115200 bps and defaults to 9600 bps	N/A
		RJ-45 +SFP	2 combo interfaces,support optical-electrical switching	Copper port:—10/100/1000 Mbps, half/full duplex	N/A
				Fiber port: 1000 Mbps, full duplex	Gigabit SFP module
LSQ1FWBSC0	HP 7500 VPN Firewall Module	RJ-45	One console port	No greater than 115200 bps and defaults to 9600 bps	N/A
		RJ-45	2 copper ports	10/100/1000 Mbps, half/full duplex	N/A
		RJ-45 +SFP	2 combo interfaces,support optical-electrical switching	Copper port:10/100/1000 Mbps, half/full duplex	N/A
				Fiber port: 1000 Mbps, full duplex	Gigabit SFP module
LSQ1LBSC0	HP 7500 Load Balancing Module	RJ-45	One console port	No greater than 115200 bps and defaults to 9600 bps	N/A
		RJ-45	2 copper ports	10/100/1000 Mbps, half/full duplex	N/A

LPU	Description	Connector	Number of interfaces	Interface transmission rate	Available transceiver modules
		RJ-45 +SFP	2 combo interfaces,support optical-electrical switching	Copper port:10/100/1000 Mbps, half/full duplex	N/A
				Fiber port: 1000 Mbps, full duplex	Gigabit SFP module
LSQ1NSMSC0	HP 7500 NetStream Monitoring Module	RJ-45	One console port	No greater than 115200 bps and defaults to 9600 bps	N/A
		RJ-45	2 copper ports	10/100/1000 Mbps, half/full duplex	N/A
		RJ-45 +SFP	2 combo interfaces,support optical-electrical switching	Copper port:10/100/1000 Mbps, half/full duplex	N/A
				Fiber port: 1000 Mbps, full duplex	Gigabit SFP module
LSQ1SSLSC0	HP 7500 SSL VPN Module with 500-user License	RJ-45	One console port	No greater than 115200 bps and defaults to 9600 bps	N/A

NOTE:

- For the transceiver modules available for each LPU, see "Transceiver modules."
- Support for some software features depends on the LPU model. For more information, contact the local agents.
- For more information about LSU3WCMD0, see *HP 10500_7500 20G Unified Wired-WLAN Module Card Manual.*
- For more information about LSU1FWCEA0, see *HP 10500/11900/7500 20Gbps VPN Firewall Card Manual.*
- For more information about LSQ1FWBSC0, see *HP 7500 VPN Firewall Card Manual.*
- For more information about LSQ1LBSC0, see *HP 7500 Load Balancing Card Manual.*
- For more information about LSQ1NSMSC0, see *HP 7500 NetStream Monitoring Card Manual.*
- For more information about LSQ1SSLSC0, see *HP 7500 SSL VPN Card Manual.*

Power supplies

CAUTION:

- A chassis must be configured with at least one power supply. To improve power supply availability, you can configure a chassis with two power supplies, which back up each other.
- The power supplies installed on an HP 7500 switch must be the same model.

Table 46 describes the power supplies available for the 7500 switches, and Table 47 describes the power supply and switch chassis compatibility.

Table 46 Power supplies available for the 7500 switches

Power supply model	Height	Input	Support for PoE	Rated voltage range	Maximum output power	Maximum PoE output power
300W AC	1 RU	AC	No	100 VAC to 240 VAC, 50/60 Hz	300 W	N/A
300W DC	1 RU	DC	No	–48 VDC to –60 VDC	300 W	N/A
650W AC	1 RU	AC	No	100 VAC to 240 VAC, 50/60Hz	650 W	N/A
650W DC	1 RU	DC	No	–48 VDC to –60 VDC	650 W	N/A
1400W AC	3 RU	AC	No	100 VAC to 240 VAC, 50/60Hz	1150 W at 110 V 1400 W at 220 V	N/A
1400W DC	3 RU	DC	Yes	–48 VDC to –60 VDC	1400 W	6720 W
2800W AC	3 RU	AC	Yes	100 VAC to 240 VAC, 50/60Hz	1150 W at 110 V 1400 W at 220 V	1150 W at 110 V 1400 W at 220 V
6000W AC	3 RU	AC	Yes	100 VAC to 240 VAC 50/60Hz	1150 W at 110 V	• One PoE input: 1200 W • Two PoE inputs: 2400 W • Three PoE inputs: 3600 W
					1400 W at 220 V	• One PoE input: 1800 W • Two PoE inputs: 3600 W • Three PoE inputs: 5300 W

NOTE:

The rack unit (RU) specifies the rack height, and 1 RU is 44.45 mm (1.75 inch).

- Make sure the total maximum output power of the ordered power supplies is greater than the overall power consumption. HP recommends that you reserve 20% of the maximum output power.
- If the switch is expected to supply power for attached devices through PoE, order a power supply that can be used for setting up a PoE system depending on the switch model, and make sure the maximum PoE output power of the power supply is greater than the PoE power consumption.

NOTE:

- For more information about installing power supplies, see "Installing FRUs."
- For more information about the overall power consumption and PoE power consumption, see "Appendix A Chassis views and technical specifications."
- For more information about supplying power through PoE, see "Installing FRUs."

Table 47 Power supply and chassis compatibility matrix

Power supply	7502	7503-S	7503	7506	7506-V	7510
300W AC	●	●	—	—	—	—
300W DC	●	●	—	—	—	—
650W AC	●	●	—	—	—	—
650W DC	●	●	—	—	—	—
1400W AC	—	—	●	●	●	●
1400W DC	—	—	●	●	●	●
2800W AC	—	—	●	●	●	●
6000W AC	—	—	●	●	●	●

Fan assembly

All 7500 switches come with a fan assembly installed. When you replace the fan assembly on your 7500 switch, use Table 48 to check for incompatibility.

Table 48 Fan assemblies available for the 7500 switches

Fan assembly	Number of fans	Fan diameter	Max rotating speed	Max airflow
7502 fan assembly	3	92 mm (3.62 in)	3800 RPM	165 CFM
7503-S fan assembly	3	92 mm (3.62 in)	3800 RPM	165 CFM
7503 fan assembly	6	92 mm (3.62 in)	3800 RPM	330 CFM
7506 fan assembly	9	92 mm (3.62 in)	3800 RPM	495 CFM

Fan assembly	Number of fans	Fan diameter	Max rotating speed	Max airflow
7506-V fan assembly	6	120 mm (4.72 in)	3200 RPM	546 CFM
7510 fan assembly	6/4	92 mm (3.62 in)/120 mm (4.72 in)	3800 RPM/3100 RPM	662 CFM

- The fans on the 7503-S fan assembly rotate at a fixed speed and cannot automatically adapt to the ventilation condition.
- The fans on all other 7500 fan assemblies can automatically adapt their rotating speed to the ventilation condition.

Mounting accessories

Before installing the switch to the rack, install slide rails to the rack. You can order an HP X421 A-Series Chassis Universal 4-Post Rack Mounting Kit (JC665A).

An HP X421 A-Series Chassis Universal 4-Post Rack Mounting Kit (JC665A) includes cage nuts, screws, and a pair of slide rails. The length of the slide rails is in the range of 500 mm (19.69 in) to 800 mm (31.50 in), and a pair of slide rails can bear up to 350 kg (771.60 lb) of weight. Before using the slide rail, make sure:

- The inside depth of the rack falls into the length range of the slide rail.
- The slide rails can support the total weight of the switch chassis and its accessories.

DC cables

If you use an A-RPS800 as the external PoE power supply, order an HP X290 14-pin Mini-Fit to 2 x OT Copper Lug 1m RPS Power Cable (JG332A). At one end of the cable is an H2*7 plug, and at the other end of the cable are two OT terminals with a minus (–) sign on the blue wire and a plus (+) sign on the black wire.

If a 1400W DC power supply is used and the total power consumption of the switch (the system power consumption plus the PoE power consumption) is greater than 3300 W, order HP X210 JG2 to T50 3m DC (2) Power Cables (JG333A). The cable kit includes two cables, each having a minus (–) sign on the blue wire and a plus (+) sign on the black wire.

PoE DIMM

You must install a PoE dual-in-line memory (DIMM) module on a PoE-capable LPU (except the LSQ1GV48SD0 and LSQ3GV48SC0) to supply power over Ethernet.

Use Table 49 to check for incompatibility when you install a PoE DIMM on an LPU. If an incompatible PoE DIMM module is used, the Ethernet ports on the LPU work as common Ethernet ports and do not supply power to powered devices (PDs).

Table 49 PoE DIMM module and PoE-capable LPU compatibility matrix

PoE-capable LPU	PoE-capable ports	Compatible PoE DIMM modules	PoE standard
LSQ1GV48SD0	48	No PoE DIMM is required	Type 1, Type 2

PoE-capable LPU	PoE-capable ports	Compatible PoE DIMM modules	PoE standard
LSQ3GV48SC0			
LSQ1CGV24PSC0 LSQ1GV24PSC0 LSQ1GV24PSA0	24	HP 7500 24-port PoE DIMM(JC671A)	Type 1
LSQ1FV48SA0 LSQ1GV48SA0 LSQ1GV48SC0	48	HP 7500 48-port PoE DIMM(JD192B)	Type 1
LSQ1GV40PSC0	40	HP 7500 48-port PoE DIMM (JD192B)	Type 1

NOTE:

- **Type 1**—A port outputs 0 to 15.4 W of power at 44 V to 57 V, and the maximum current is 350 mA. This type is applicable to class 0 to class 3 powered devices.
- **Type 2**—A port outputs 0 to 30 W of power at 50 V to 57 V, and the maximum current is 600 mA. This type is applicable to class 0 to class 4 powered devices.

NOTE:

The LSQ1GV48SD0 and LSQ3GV48SC0 each can provide a maximum of 806 W power through PoE. When you use the cards to power devices through PoE, make sure the total power of PDs does not exceed 806 W.

CF cards

You can install a CF card on some MPUs (see Table 43) to expand storage space for saving files.

Table 50 CF cards available for the 7500 switches

CF card model	Description	Storage capacity
CF-256M-I	HP 7500 256M Compact Flash Card(JC686A)	256 MB
CF-512M	HP 7500 512M Compact Flash Card(JC685A)	512 MB
CF-1G	HP 7500 1G Compact Flash Card(JC684A)	1 GB

Transceiver modules

This section describes the following transceiver modules:

- CFP transceiver modules (Table 51)
- QSFP+ transceiver modules (Table 52)
- QSFP+ cables (Table 53)
- QSFP+ to SFP+ cables (Table 54)
- 10-Gigabit XFP transceiver modules (Table 55)
- 10-Gigabit SFP+ transceiver modules (Table 56)
- 10-Gigabit SFP+ cables (Table 57)

- Gigabit SFP transceiver modules (Table 58)
- 100-Mbps SFP transceiver modules (Table 59) available for the 7500 switches

Table 51 CFP module specifications

Product code	Description	Central wavelength(nm)	Fiber diameter (μm)	Maximum transmission distance
JC857A	HP X140 40G CFP LC LR4 10km SM Transceiver	1310	9/125	10 km (6.21 miles)

Table 52 QSFP+ module specifications

Product code	Description	Connector	Fiber specifications	Multimode fiber modal bandwidth (MHz*km)	Maximum transmission distance
JG325A	HP X140 40G QSFP+ MPO SR4 Transceiver	MPO	MULTIMODE 50/125μm OM3	2000	100 m (328.08 ft)

Table 53 QSFP+ cable specifications

Product code	Description	Cable length	Remarks
JG326A	HP X240 40G QSFP+ QSFP+ 1m Direct Attach Copper Cable	1 m (3.28 ft)	Used for connecting 40 G QSFP+ ports.
JG327A	HP X240 40G QSFP+ QSFP+ 3m Direct Attach Copper Cable	3 m (9.84 ft)	
JG328A	HP X240 40G QSFP+ QSFP+ 5m Direct Attach Copper Cable	5 m (16.40 ft)	

Table 54 QSFP+ to SFP+ cable specifications

Product code	Description	Cable length	Remarks
JG329A	HP X240 40G QSFP+ to 4x10G SFP+ 1m Direct Attach Copper Splitter Cable	1 m (3.28 ft)	Used for connecting 40 GE QSFP+ ports and 10 GE SFP+ ports.
JG330A	HP X240 40G QSFP+ to 4x10G SFP+ 3m Direct Attach Copper Splitter Cable	3 m (9.84 ft)	
JG331A	HP X240 40G QSFP+ to 4x10G SFP+ 5m Direct Attach Copper Splitter Cable	5 m (16.40 ft)	

Table 55 XFP modules available for the 7500 switches

Product Code	Description	Central wavelength (nm)	Fiber diameter (μm)	Multimode fiber modal bandwidth (MHz*km)	Max transmission distance
JD117B	HP X130 10G XFP LC SR Transceiver	850	50/125	2000	300 m (984.25 ft)
				500	82 m(269.03 ft)
				400	66 m(216.54 ft)
			62.5/125	220	33 m (108.27 ft)
				160	26 m (85.3 ft)
JD108B	HP X130 10G XFP LC LR Transceiver	1310	9/125	N/A	10 km (6.21 miles)
JD121A	HP X135 10G XFP LC ER Transceiver	1550	9/125	N/A	40 km (24.86 miles)
JD107A	HP X130 10G XFP LC ZR Transceiver	1550	9/125	N/A	80 km (49.71 miles)
JG226A	HP X180 10G XFP LC LH 80km 1538.98nm DWDM Transceiver	1538.98	9/125	N/A	80 km (49.71 miles)
JG227A	HP X180 10G XFP LC LH 80km 1539.77nm DWDM Transceiver	1539.77	9/125	N/A	80 km (49.71 miles)
JG228A	HP X180 10G XFP LC LH 80km 1540.56nm DWDM Transceiver	1540.56	9/125	N/A	80 km (49.71 miles)
JG229A	HP X180 10G XFP LC LH 80km 1542.14nm DWDM Transceiver	1542.14	9/125	N/A	80 km (49.71 miles)
JG230A	HP X180 10G XFP LC LH 80km 1542.94nm DWDM Transceiver	1542.94	9/125	N/A	80 km (49.71 miles)
JG231A	HP X180 10G XFP LC LH 80km 1558.98nm DWDM Transceiver	1558.98	9/125	N/A	80 km (49.71 miles)
JG232A	HP X180 10G XFP LC LH 80km 1559.79nm DWDM Transceiver	1559.79	9/125	N/A	80 km (49.71 miles)
JG233A	HP X180 10G XFP LC LH 80km 1560.61nm DWDM Transceiver	1560.61	9/125	N/A	80 km (49.71 miles)

NOTE:

The 9/125μm single-mode fibers used by modules JG226A through JG233A should conform to ITU-T G.655, and those used by other modules should conform to ITU-T G.652.

Table 56 SFP+ modules available for the 7500 switches

Product Code	Description	Central wavelength (nm)	Fiber diameter (μm)	Multimode fiber modal bandwidth (MHz*km)	Maximum transmission distance
JD092B	HP X130 10G SFP+ LC SR Transceiver	850	50/125	2000	300 m (984.25 ft)
				500	82 m (269.03 ft)
				400	66 m (216.54 ft)
			62.5/125	200	33 m (108.27 ft)
				160	26 m (85.3 ft.)
JD093B	HP X130 10G SFP+ LC LRM Transceiver	1310	50/125	1500	220 m (721.78 ft)
				500	
				400	100 m (328.08 ft)
			62.5/125	200	220 m (721.78 ft)
				160	
JD094B	HP X130 10G SFP+ LC LR Transceiver	1310	9/125	N/A	10 km (6.21 miles)
JG234A	HP X130 10G SFP+ LC ER 40km Transceiver	1550	9/125	N/A	40 km (24.86 miles)

Table 57 SFP+ cables available for the 7500 switches

Product Code	Description	Cable length	Cable type	Description
JD096C	HP X240 10G SFP+ SFP+ 1.2m Direct Attach Copper Cable	1.2 m (3.94 ft)	SFP+ cable	Used for connecting SFP+ ports
JD097C	HP X240 10G SFP+ SFP+ 3m Direct Attach Copper Cable	3 m (9.84 ft)		
JG081C	HP X240 10G SFP+ SFP+ 5m Direct Attach Copper Cable	5 m (16.40 ft)		

Table 58 Gigabit SFP modules available for the 7500 switches

Product Code	Description	Central wavelength (nm)	Fiber diameter (μm)	Multimode fiber modal bandwidth (MHz*km)	Maximum transmission distance
JD089B	HP X120 1G SFP RJ45 T Transceiver	N/A	Category-5 twisted pair	N/A	100 m (328.08 ft)

Product Code	Description	Central wavelength (nm)	Fiber diameter (μm)	Multimode fiber modal bandwidth (MHz*km)	Maximum transmission distance
JD118B	HP X120 1G SFP LC SX Transceiver	850	50/125	500	550 m (1804.46 ft)
				400	500 m (1640.42 ft)
			62.5/125	200	275 m (902.23 ft)
				160	220 m (721.78 ft)
JD119B	HP X120 1G SFP LC LX Transceiver	1310	9/125	N/A	10 km (6.21 miles)
			50/125	500	550 m (1804.46 ft)
				400	
			62.5/125	500	550 m (1804.46 ft)
JD061A	HP X125 1G SFP LC LH40 1310nm Transceiver	1310	9/125	N/A	40 km (24.86 miles)
JD062A	HP X120 1G SFP LC LH40 1550nm Transceiver	1550	9/125	N/A	40 km (24.86 miles)
JD063B	HP X125 1G SFP LC LH70 Transceiver	1550	9/125	N/A	70 km (43.50 miles)
JD103A	HP X120 1G SFP LC LH100 Transceiver	1550	9/125	N/A	100 km (62.14 miles)
JD098B	HP X120 1G SFP LC BX 10-U Transceiver	TX: 1310nm RX: 1490nm	9/125	N/A	10 km (6.21 miles)
JD099B	HP X120 1G SFP LC BX 10-D Transceiver	TX: 1490nm RX: 1310nm	9/125	N/A	10 km (6.21 miles)
JD113A	HP X170 1G SFP LC LH70 1470 Transceiver	1470	9/125	N/A	70 km (43.50 miles)
JD114A	HP X170 1G SFP LC LH70 1490 Transceiver	1490	9/125	N/A	70 km (43.50 miles)
JD115A	HP X170 1G SFP LC LH70 1510 Transceiver	1510	9/125	N/A	70 km (43.50 miles)
JD116A	HP X170 1G SFP LC LH70 1530 Transceiver	1530	9/125	N/A	70 km (43.50 miles)
JD109A	HP X170 1G SFP LC LH70 1550 Transceiver	1550	9/125	N/A	70 km (43.50 miles)
JD110A	HP X170 1G SFP LC LH70 1570 Transceiver	1570	9/125	N/A	70 km (43.50 miles)
JD111A	HP X170 1G SFP LC LH70 1590 Transceiver	1590	9/125	N/A	70 km (43.50 miles)

The two modules must be used together.

Product Code	Description	Central wavelength (nm)	Fiber diameter (μm)	Multimode fiber modal bandwidth (MHz*km)	Maximum transmission distance
JD112A	HP X170 1G SFP LC LH70 1610 Transceiver	1610	9/125	N/A	70 km (43.50 miles)

NOTE:

The 100/1000-Mbps SFP port of a combo interface does not support transceiver module JD089B.

Table 59 100-Mbps SFP modules available for the 7500 switches

Product Code	Description		Central wavelength (nm)	Fiber diameter (μm)	Maximum transmission distance
JD102B	HP X115 100M SFP LC FX Transceiver		1310	50/125 62.5/125	2 km (1.24 miles)
JD120B	HP X110 100M SFP LC LX Transceiver		1310	9/125	15 km (9.32 miles)
JD090A	HP X110 100M SFP LC LH40 Transceiver		1310	9/125	40 km (24.86 miles)
JD091A	HP X110 100M SFP LC LH80 Transceiver		1550	9/125	80 km (49.71 miles)
JD100A	HP X110 100M SFP LC BX 10-U Transceiver	The two modules must be used in pairs.	TX: 1310 RX: 1550	9/125	15 km (9.32 miles)
JD101A	HP X110 100M SFP LC BX 10-D Transceiver		TX: 1550 RX: 1310	9/125	15 km (9.32 miles)

Appendix C LEDs

The HP 7500 Switch Series provides various LEDs for you to check the status of MPUs, LPUs, and power supplies. Table 60 shows the supported LEDs.

NOTE:

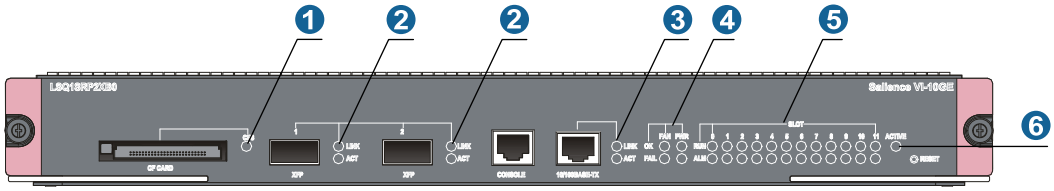
The HP 7500 Switch Series supports various MPU and LPU models. The type and quantity of LEDs vary by MPU and LPU models.

Table 60 LEDs at a glance

Category	LEDs
MPU LEDs	Management Ethernet port LEDs Power status LEDs (PWR) Fan LEDs (FAN) Card LEDs (SLOT) MPU active/standby status LED (ACTIVE) CF card status LED (CFS) RJ-45 Ethernet port LED Combo interface status LED SFP port LED XFP port LEDs
LPU LEDs	RJ-45 Ethernet port LED Combo interface status LED SFP port LED SFP+ port LEDs XFP port LEDs QSFP+ port status LEDs CFP port status LEDs
Power supply LEDs	300W AC/300W DC power supply status LED 650W AC/650W DC power supply status LED 1400W AC power supply status LEDs 1400W DC power supply status LEDs 2800W AC power supply status LEDs 6000W AC power supply status LEDs

MPU LEDs

Figure 55 MPU LEDs (LSQ1SRP2XB0 as an illustration)



(1) CF card status LED	(2) XFP port LEDs
(3) Management Ethernet port LEDs	(4) Power and fan status LEDs
(5) Card status LEDs	(6) MPU active/standby status LED

Management Ethernet port LEDs

The MPU has one LINK LED and one ACT LED to indicate the link status and data forwarding status of the management Ethernet port.

Table 61 Management Ethernet port LED description

LINK	ACT	Description
On	Flashing	A link is present, and the management Ethernet port is transmitting data.
On	Off	A link is present.
Off	Off	No link is present.

Power status LEDs (PWR)

- If an MPU provides only one power status LED (PWR), see Table 62 for the LED description.
- If an MPU provides multiple LEDs with numbers (for example, PWR1 and PWR2), each LED corresponds to a hot swappable power supply with the same number (the power supply number is marked on the chassis). See Table 63 for the LED description.

Table 62 Description for PWR LEDs without numbers

OK	FAIL	Description
On	Off	All power supplies in the chassis are operating correctly.
Off	On	A power supply has no power output. (The cause can be: the power supply is faulty or not switched on; a power cord connection problem has occurred; the external power supply is unavailable.)
Off	Off	This status has occurred in the following cases: • No power supply is installed in the chassis. • No power supplies in the chassis output power. (The cause can be: the power supplies are faulty or not switched on; a power cord connection problem has occurred; the external power supply is unavailable.)

Table 63 Description for PWR LEDs with numbers

OK	FAIL	Description
On	Off	The corresponding power supply is operating correctly.
Off	On	The corresponding power supply has no output power. (The cause can be: the power supply is faulty or not switched on; a power cord connection problem has occurred; the external power supply is unavailable.)
Off	Off	No power supply is installed in the corresponding slot.

Fan LEDs (FAN)

The MPU provides two fan LEDs (OK and FAIL) to indicate the working status of the fan assembly.

Table 64 Fan LED description

OK	FAIL	Description
On	Off	The fan assembly is operating correctly.
Off	On	A fan problem has occurred or the fan assembly is absent.
Off	Off	The switch is not powered on.

Card LEDs (SLOT)

The MPU provides card LEDs (SLOT). Table 65 shows the LED description.

- The LSQ1MPUA0 MPU provides numbered LEDs to indicate the status of LPUs in the corresponding slots. The MPU LED indicates the working status of the MPU itself.
- Other MPU models provide numbered LEDs to indicate the status of active MPUs, standby MPUs, and LPUs in the corresponding slots.

NOTE:

The number of a slot on the 7506-V is marked on both left and right sides of the slot, and that on other models is marked on the right side of the slot.

Table 65 Card LED description

RUN	ALM	Description
Flashing	Off	The corresponding card is operating correctly.
Off	On	The corresponding card is faulty.
Off	Off	This status has occurred in the following cases: • The corresponding card is absent. • The card is not started (the software version of the switch does not match that of the card).
On	On	The corresponding LPU is starting up.
On	Off	The corresponding MPU is starting up.

NOTE:

A quick flashing RUN LED indicates that the card is in the process of startup rather than operating correctly. The ALM LED will be on for a period of time at the initial phase of the system startup.

MPU active/standby status LED (ACTIVE)

The MPUs provide the active/standby status LED (ACTIVE) to indicate the status (active or standby) of the MPUs.

Table 66 MPU active/standby status LED description

LED	LED status	Description
ACTIVE	On	The MPU is active.
	Off	This status has occurred in the following cases: • The MPU is in standby status. • The MPU is faulty. Check the card LED to determine whether the MPU is faulty.

CF card status LED (CFS)

The MPUs provide a CF card status LED (CFS) to indicate the status of the CF card.

Table 67 CF card status LED description

LED	LED status	Description
CFS	On	The CF card is in position.
	Off	The CF card is absent or is damaged.

RJ-45 Ethernet port LED

The MPUs provide RJ-45 Ethernet port LEDs to indicate the link status and data receiving/forwarding status of the corresponding Ethernet ports.

Table 68 RJ-45 Ethernet port LED description

LED	LED status	Description
RJ-45 Ethernet port LED	Flashing	The Ethernet port is receiving or sending data.
	On	A link is present.
	Off	No link is present.

Combo interface status LED

A combo interface comprises an SFP port and an RJ-45 Ethernet port. Only one port of a combo interface can work at a time. The MPUs provide a combo interface status LED to indicate the link status and data receiving/forwarding status of the corresponding combo interface.

Table 69 Combo interface status LED description

LED	LED status	Description
Combo interface status LED	Flashing	The combo interface is receiving or sending data.
	On	A link is present.
	Off	No link is present.

NOTE:

- For the SFP port and the RJ-45 Ethernet port of a combo port, only one port can be active at a time. The other one is inactive. By default, the port with smaller number becomes active.
- To use the inactive port of a combo interface, execute the **undo shutdown** command to activate the port. The other port of the combo interface is then automatically shut down and becomes inactive.

SFP port LED

The MPUs provide an SFP port LED to indicate the link status and data receiving/forwarding status of the corresponding SFP port.

Table 70 SFP port LED description

LED	LED status	Description
SFP port LED	Flashing	The SFP port is receiving or sending data.
	On	A link is present.
	Off	No link is present.

XFP port LEDs

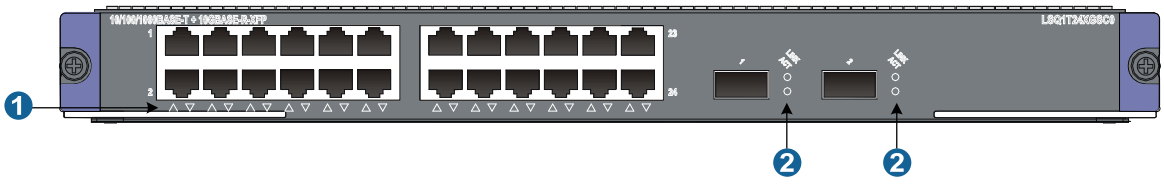
The MPUs provide XFP port LEDs to indicate the link status and data receiving/forwarding status of the corresponding XFP port.

Table 71 XFP port LED description

LINK	ACT	Description
On	Flashing	A link is present, and the XFP port is receiving or sending data.
On	Off	A link is present, but no data is being received or sent.
Off	Off	No link is present.

LPU LEDs

Figure 56 LPU LEDs (LSQ1T24XGSC0 as an illustration)



(1) RJ-45 Ethernet port LED (2) XFP port LEDs

RJ-45 Ethernet port LED

The LPUs provide RJ-45 Ethernet port LEDs to indicate the link status and data receiving/forwarding status of the corresponding Ethernet ports.

Table 72 RJ-45 Ethernet port LED description

LED	LED status	Description
RJ-45 Ethernet port LED	Flashing	The Ethernet port is receiving or sending data.
	On	A link is present.
	Off	No link is present.

Combo interface status LED

A combo interface comprises an SFP port and an RJ-45 Ethernet port. Only one port of a combo interface can work at a time. The LPUs provide a combo interface status LED to indicate the link status and data receiving/forwarding status of the corresponding combo interface.

Table 73 Combo interface status LED description

LED	LED status	Description
Combo interface status LED	Flashing	The combo interface is receiving or sending data.
	On	A link is present.
	Off	No link is present.

NOTE:

- For the SFP port and the RJ-45 Ethernet port of a combo interface, only one port can be active at a time. The other one is inactive. By default, the port with smaller number becomes active.
- To use the inactive port of a combo interface, execute the **undo shutdown** command to activate the port. The other port of the combo interface is then automatically shut down and becomes inactive.

SFP port LED

The LPUs provide an SFP port LED to indicate the link status and data receiving/forwarding status of the corresponding SFP port.

Table 74 SFP port LED description

LED	LED status	Description
SFP port LED	Flashing	The SFP interface is receiving or sending data.
	On	A link is present.
	Off	No link is present.

SFP+ port LEDs

The LPUs provide SFP+ port LEDs to indicate the link status and data receiving/forwarding status of the corresponding SFP+ port .

Table 75 SFP+ port LED description

LINK	ACT	Description
On	Flashing	A link is present, and the SFP+ port is receiving or sending data.
On	Off	A link is present, but no data is being received or sent.
Off	Off	No link is present.

XFP port LEDs

The LPUs provide XFP port LEDs to indicate the link status and data receiving/forwarding status of the corresponding XFP port .

Table 76 XFP port LED description

LINK	ACT	Description
On	Flashing	A link is present, and the XFP port is receiving or sending data.
On	Off	A link is present, but no data is being received or sent.
Off	Off	No link is present.

QSFP+ port status LEDs

The LPUs provide QSFP+ port status LEDs to indicate the link status and data receiving/forwarding status of the corresponding QSFP+ port.

Table 77 QSFP+ port status LED description

LED status	Description
Flashing	The QSFP+ port is receiving or sending data.
On	A link is present.
Off	No link is present.

CFP port status LEDs

The LPUs provide CFP port status LEDs to indicate the link status and data receiving/forwarding status of the corresponding CFP port.

Table 78 CFP port status LED description

LED status	Description
Flashing	The CFP port is receiving or sending data.
On	A link is present.
Off	No link is present.

Power supply LEDs

The 7500 Switch Series supports various power supply models. Each power supply provides a LED to indicate the operating status of the power supply. The power supply LEDs vary with power supply models.

300W AC/300W DC power supply status LED

The 300W AC/300W DC power supply provides a red-green status LED.

Table 79 300W AC/300W DC power supply status LED description

LED	Status	Description	Analysis
Power supply status LED	Green	The power supply is operating correctly.	N/A
	Red	The power supply is operating incorrectly.	This status has occurred in the following cases: • The power supply generates an alarm due to input under-voltage, output short-circuit, output over-current, output over-voltage, or over temperature, and enters the protection state. • A fan failure has occurred.
	Off	A power input problem has occurred.	This status has occurred in the following cases: • The power supply is faulty. • A power cord connection problem has occurred. • The external power supply is unavailable. • The power supply is not switched on.

650W AC/650W DC power supply status LED

The 650W AC/650W DC power supply provides a red-green status LED.

Table 80 650W AC/650W DC power supply status LED description

LED	Status	Description	Analysis
Power supply status LED	Green	The power supply is operating correctly.	N/A
	Red	The power supply is operating incorrectly.	This status has occurred in the following cases: • The power supply generates an alarm due to input under-voltage, output short-circuit, output over-current, output over-voltage, or over temperature, and enters the protection state. • A fan failure has occurred.
	Off	A power input problem has occurred.	This status has occurred in the following cases: • The power supply is faulty. • A power cord connection problem has occurred. • The external power supply is unavailable. • The power supply is not switched on.

1400W AC power supply status LEDs

The 1400W AC power supply provides these red-green status LEDs: power input LED (INPUT), power output LED (OUTPUT), and fan LED (FAN).

Table 81 1400W AC power supply status LED description

LED	Status	Description	Analysis
INPUT	Green	The power is input correctly.	N/A
	Red	A power input problem has occurred.	The input voltage is not in the rated voltage range.
	Off	No power is input.	This status has occurred in the following cases: • The power supply is faulty. • A power cord connection problem has occurred. • The external power supply is unavailable.
OUTPUT	Green	The power is output correctly.	N/A
	Red	A power output problem has occurred.	This status has occurred in the following cases: • The power supply generates an alarm due to input under-voltage, output short-circuit, output over-current, output over-voltage, or over temperature, and enters the protection state. • The power supply is not switched on.
	Off	No power is output.	This status has occurred in the following cases: • The power supply is faulty. • A power cord connection problem has occurred. • The external power supply is unavailable.
FAN	Green	The fans are operating correctly.	N/A
	Red	The fans are operating incorrectly.	This status has occurred in the following cases: • A fan failure has occurred. • The power supply is not switched on.
	Off	The fans do not work.	This status has occurred in the following cases: • The power supply is faulty. • A power cord connection problem has occurred. • The external power supply is unavailable.

1400W DC power supply status LEDs

The 1400W DC power supply provides these red-green status LEDs: power input LED (INPUT), power output LED (OUTPUT), fan LED (FAN), and PoE status LED (PoE).

Table 82 1400W DC power supply status LED description

LED	Status	Description	Analysis
INPUT	Green	The power is input correctly, and the system power output switch is turned on.	N/A
	Red	A power input problem has occurred.	The input voltage is not in the rated voltage range.

LED	Status	Description	Analysis
	Off	No power is input.	This status has occurred in the following cases: • The power supply is faulty. • A power cord connection problem has occurred. • The external power supply is unavailable. • The system power output switch is not turned on.
OUTPUT	Green	The power is output correctly.	N/A
	Red	A power output problem has occurred.	The power supply generates an alarm due to output short-circuit, output over-current, output over-voltage, or over temperature, and enters the protection state.
	Off	No power is output.	This status has occurred in the following cases: • The power supply is faulty. • A power cord connection problem has occurred. • The external power supply is unavailable. • The system power output switch is not turned on.
FAN	Green	The fans are operating correctly.	N/A
	Red	The fans are operating incorrectly.	A fan failure has occurred.
	Off	The fans do not work.	This status has occurred in the following cases: • The power supply is faulty. • A power cord connection problem has occurred. • The external power supply is unavailable. • The system power output switch is not turned on.
PoE	Green	The PoE power is output correctly.	N/A
	Red	A PoE power output problem has occurred.	The PoE output voltage is not in the rated voltage range.
	Off	No PoE power is output.	This status has occurred in the following cases: • The power supply is faulty. • A power cord connection problem has occurred. • The external power supply is unavailable. • The PoE power output switch is not turned on.

2800W AC power supply status LEDs

The 2800W AC power supply provides these red-green status LEDs: power input LED (INPUT), power output LED (OUTPUT), fan LED (FAN), PoE input LED (PoE INPUT), and PoE output LED (PoE OUTPUT).

Table 83 2800W AC power supply status LED description

LED	Status	Description	Analysis
INPUT	Green	The power is input correctly.	N/A
	Red	A power input problem has occurred.	The input voltage is not in the rated voltage range.
	Off	No power is input.	This status has occurred in the following cases: • The power supply is faulty. • A system input power cord connection problem has occurred. • The external power supply is unavailable.
OUTPUT	Green	The power is output correctly.	N/A
	Red	A power output problem has occurred.	This status has occurred in the following cases: • The power supply generates an alarm due to input under-voltage, output short-circuit, output over-current, output over-voltage, or over temperature, and enters the protection state. • The system power switch is not turned on.
	Off	No power is output.	This status has occurred in the following cases: • The power supply is faulty. • A system input power cord connection problem has occurred. • The external power supply is unavailable.
FAN	Green	The fans are operating correctly.	N/A
	Red	The fans are operating incorrectly.	This status has occurred in the following cases: • A fan failure has occurred. • The system power switch is not turned on.
	Off	The fans do not work.	This status has occurred in the following cases: • The power supply is faulty. • A system input power cord connection problem has occurred. • The external power supply is unavailable.
PoE INPUT	Green	The PoE power is input correctly.	N/A
	Red	A PoE power input problem has occurred.	The PoE input voltage is not in the rated voltage range.
	Off	No PoE power is input.	This status has occurred in the following cases: • The power supply is faulty. • A PoE input power cord connection problem has occurred. • The external power supply is unavailable.

LED	Status	Description	Analysis
PoE OUTPUT	Green	The PoE power is output correctly.	N/A
	Red	A PoE power output problem has occurred.	This status has occurred in the following cases: • The PoE output voltage is not in the rated voltage range. • The PoE power switch is not turned on.
	Off	No PoE power is output.	This status has occurred in the following cases: • The power supply is faulty. • A PoE input power cord connection problem has occurred. • The external power supply is unavailable.

6000W AC power supply status LEDs

The 6000W AC power supply provides these red-green status LEDs: system power input LED (SYS IN), system power output LED (SYS OUT), fan LED (SYS FAN), power input LED (PoE IN1, PoE IN2, and PoE IN3), power output LED (PoE OUTPUT), and PoE fan LED (PoE FAN).

Table 84 6000W AC power supply status LED description

LED	Status	Description	Analysis
SYS IN	Green	The system power is input correctly.	N/A
	Red	A system power input problem has occurred.	The system input voltage is not in the rated voltage range.
	Off	No system power is input.	This status has occurred in the following cases: • The power supply is faulty. • A system input power cord connection problem has occurred. • The external power supply is unavailable.
SYS OUT	Green	The system power is output correctly.	N/A
	Red	A system power output problem has occurred.	This status has occurred in the following cases: • The power supply generates an alarm due to output short-circuit, output over-current, output over-voltage, or over temperature, and enters the protection state. • The system power switch is not turned on.
	Off	No system power is output.	This status has occurred in the following cases: • The power supply is faulty. • A system input power cord connection problem has occurred. • The external power supply is unavailable.

LED	Status	Description	Analysis
SYS FAN	Green	The fans are operating correctly.	N/A
	Red	The fans are operating incorrectly.	This status has occurred in the following cases: • A fan failure has occurred. • The system power switch is not turned on.
	Off	The fans do not work.	This status has occurred in the following cases: • The power supply is faulty. • A system input power cord connection problem has occurred. • The external power supply is unavailable.
PoE IN1	Green	The PoE power (PoE1) is input correctly.	N/A
	Red	A power input problem has occurred to PoE1.	The input voltage of PoE1 is not in the rated voltage range.
	Off	No power of PoE1 is input.	This status has occurred in the following cases: • The power supply is faulty. • An input power cord connection problem has occurred to PoE1. • The external power supply is unavailable.
PoE IN2	Green	The PoE power (PoE2) is input correctly.	N/A
	Red	A power input problem has occurred to PoE2.	The input voltage of PoE2 is not in the rated voltage range.
	Off	No power of PoE2 is input.	This status has occurred in the following cases: • The power supply is faulty. • An input power cord connection problem has occurred to PoE2. • The external power supply is unavailable.
PoE IN3	Green	The PoE power (PoE3) is input correctly.	N/A
	Red	A power input problem has occurred to PoE3.	The input voltage of PoE3 is not in the rated voltage range.
	Off	No power of PoE3 is input.	This status has occurred in the following cases: • The power supply is faulty. • An input power cord connection problem has occurred to PoE3. • The external power supply is unavailable.

LED	Status	Description	Analysis
PoE OUT	Green	The PoE power is output correctly.	N/A
	Red	A PoE power output problem has occurred.	This status has occurred in the following cases: • The power supply generates an alarm due to output short-circuit, output over-current, output over-voltage, or over temperature, and enters the protection state. • The PoE power switch is not turned on.
	Off	No PoE power is output.	This status has occurred in the following cases: • The power supply is faulty. • An input power cord connection problem has occurred to PoE1, PoE2, and PoE3. • The external power supply is unavailable.
PoE FAN	Green	The PoE fans are operating correctly.	N/A
	Red	The PoE fans are operating incorrectly.	This status has occurred in the following cases: • A PoE fan failure has occurred. • The PoE power switch is not turned on.
	Off	No PoE power is input.	This status has occurred in the following cases: • The power supply is faulty. • An input power cord connection problem has occurred to PoE1, PoE2, and PoE3. • The external power supply is unavailable.

Appendix D Cables

This chapter describes the cables available for connecting ports on MPUs and LPUs.

Table 85 Cable description

Cable	Port type	Application
Ethernet twisted pair cable	RJ-45 Ethernet ports	Connects RJ-45 Ethernet ports to transmit data
Optical fiber	XFP/SFP+/SFP/CFP/QSFP+ ports	Connects the fiber ports to transmit data
SFP+ cable	SFP+ ports	Connects SFP+ ports to transmit data
QSFP+ cable	QSFP+ ports	Connects QSFP+ ports to transmit data
QSFP+ to SFP+ cable	QSFP+ port at one end, and SFP+ port at the other end	Connects a QSFP+ port to an SFP+ port

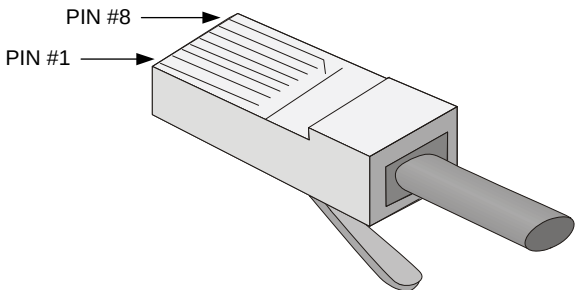
Ethernet twisted pair cable

An Ethernet twisted pair cable consists of four pairs of insulated wires twisted together. It mainly transmits analog signals and is advantageous in transmitting data over shorter distances. The maximum transmission distance is 100 m (328.08 ft).

RJ-45 connector

An Ethernet twisted pair cable connects network devices through the RJ-45 connectors at the two ends. Figure 57 shows the pinouts of an RJ-45 connector.

Figure 57 RJ-45 connector pinout diagram



Cable pinouts

EIA/TIA cabling specifications define two standards: 568A and 568B for cable pinouts.

- **Standard 568A**—pin 1: white/green stripe, pin 2: green solid, pin 3: white/orange stripe, pin 4: blue solid, pin 5: white/blue stripe, pin 6: orange solid, pin 7: white/brown stripe, pin 8: brown solid.

- **Standard 568B**—pin 1: white/orange stripe, pin 2: orange solid, pin 3: white/green stripe, pin 4: blue solid, pin 5: white/blue stripe, pin 6: green solid, pin 7: white/brown stripe, pin 8: brown solid.

Cable type

Based on performance

Ethernet cables can be classified into category 3, category 4, category 5, category 5e, category 6, and category 7 cable based on performance. In LANs, category 5, category 5e, and category 6 are commonly used.

Table 86 Description on commonly used Ethernet cables

Type	Description
Category 5	Transmits data at a maximum speed of 100 Mbps, with a bandwidth of 100 MHz.
Category 5e	Transmits data at a maximum speed of 1000 Mbps, with a bandwidth of 100 MHz.
Category 6	Transmits data at a speed higher than 1 Gbps, with a bandwidth of 250 MHz.

NOTE:

The RJ-45 Ethernet ports of the 7500 Switch Series use category 5 or higher Ethernet twisted pair cables for connection.

Based on pinouts

Ethernet twisted pair cables can be classified into straight through and crossover cables based on their pinouts.

- Straight-through: The pinouts at both ends comply with standard 568B, as shown in Figure 58.
- Crossover: The pinouts at one end comply with standard 568B, and those at the other end comply with standard 568A, as shown in Figure 59.

Figure 58 Straight-through cable

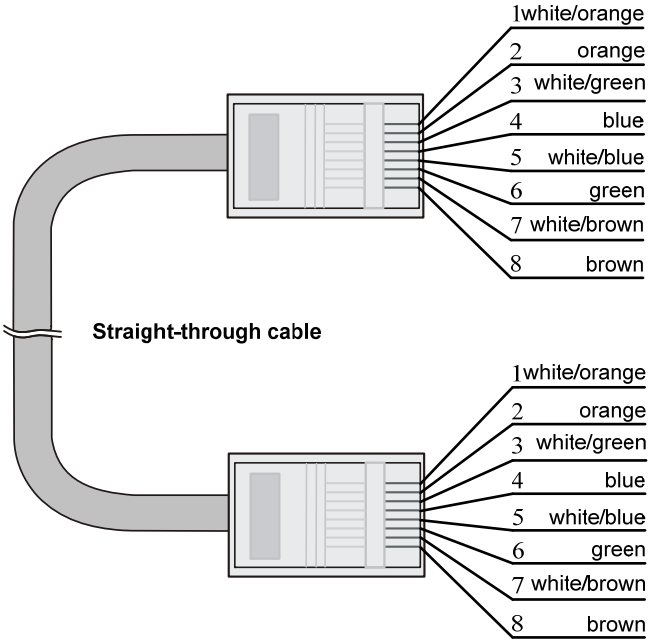
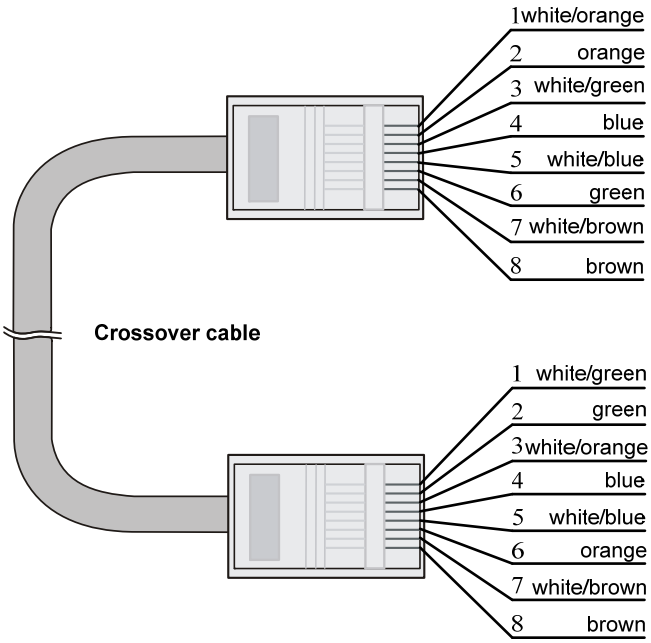


Figure 59 Crossover cable



Pin assignments

Select an Ethernet twisted pair cable according to the RJ-45 Ethernet interface type on your device. An RJ-45 Ethernet interface can be MDI (for routers and PCs) or MDIX (for switches). For the pinouts of RJ-45 Ethernet interfaces, see Table 87 and Table 88.

Table 87 RJ-45 MDI interface pinouts

Pin	10Base-T/100Base-TX		1000Base-T	
	Signal	Function	Signal	Function
1	Tx+	Send data	BIDA+	Bi-directional data cable A+
2	Tx-	Send data	BIDA-	Bi-directional data cable A-
3	Rx+	Receive data	BIDB+	Bi-directional data cable B+
4	Reserved	N/A	BIDC+	Bi-directional data cable C+
5	Reserved	N/A	BIDC-	Bi-directional data cable C-
6	Rx-	Receive data	BIDB-	Bi-directional data cable B-
7	Reserved	N/A	BIDD+	Bi-directional data cable D+
8	Reserved	N/A	BIDD-	Bi-directional data cable D-

Table 88 RJ-45 MDI-X interface pinouts

Pin	10Base-T/100Base-TX		1000Base-T	
	Signal	Function	Signal	Function
1	Rx+	Receive data	BIDB+	Bi-directional data cable B+
2	Rx-	Receive data	BIDB-	Bi-directional data cable B-
3	Tx+	Send data	BIDA+	Bi-directional data cable A+
4	Reserved	N/A	BIDD+	Bi-directional data cable D+
5	Reserved	N/A	BIDD-	Bi-directional data cable D-
6	Tx-	Send data	BIDA-	Bi-directional data cable A-
7	Reserved	N/A	BIDC+	Bi-directional data cable C+
8	Reserved	N/A	BIDC-	Bi-directional data cable C-

To ensure normal communication, the pins for sending data on one port should correspond to the pins for receiving data on the peer port. When both of the ports on the two devices are MDI or MDIX, a crossover Ethernet cable is needed. A cross-over cable connects devices of the same type. When one port is MDI and the other is MDIX, a straight-through Ethernet cable is needed. A straight-through cable connects devices of different types.

If an RJ-45 Ethernet interface with MDI/MDIX autosensing enabled can automatically negotiate pin roles. The 7500 RJ-45 Ethernet interfaces support MDI/MDIX. By default, MDI/MDIX is enabled on a port.

Making an Ethernet twisted pair cable

1. Cut the cable to length with the crimping pliers.
2. Strip off an appropriate length of the cable sheath. The length is typically that of the RJ-45 connector.
3. Untwist the pairs so that they can lay flat, and arrange the colored wires based on the wiring specifications.

4. Cut the top of the wires even with one another. Insert the wires into the RJ-45 end and make sure the wires extend to the front of the RJ-45 end and make good contact with the metal contacts in the RJ-45 end and in the correct order.
5. Crimp the RJ-45 connector with the crimping pliers until you hear a click.
6. Repeat the above steps with the other end of the cable.
7. Use a cable tester to verify the correct connectivity of the cable.

Optical fiber

CAUTION:

Use the same types of transceiver modules, pigtail cords, patch cords, and fiber cables. If you use single-mode optical fibers, the transceiver modules, pigtail cords, patch cords, and fiber cables must be single-mode.

Optical fibers have been widely used for long-distance communications.

Optical fibers can be classified into the following types:

- **Single mode fiber**—It has a core size of 10 μm or smaller, and has a lower modal dispersion. It carries only a single ray of light. It is mostly used for communication over longer distances.
- **Multi-mode fiber**—It has a core size of 50 μm or 62.5 μm or higher, and has a higher modal dispersion than single-mode optical fiber. It is mostly used for communication over shorter distances.

Table 89 Allowed maximum tensile force and crush load

Period of force	Tensile load (N)	Crush load (N/mm)
Short period	150	500
Long term	80	100

Concepts

Optical fiber cable

An optical fiber cable is a bundle of optical fibers. The optical fiber elements are typically individually coated with plastic layers and contained in a protective tube. Optical fiber cables fall into single-mode and multi-mode.

Patch cord

A fiber that has connectors at both ends is called a patch cord. A patch cord connects one optical device to another for signal routing. Patch cords fall into single-mode and multi-mode patch cords.

- Single-mode patch cord: The jacket is yellow. It permits transmission over longer distances.
- Multi-mode patch cord: The jacket is orange. It permits transmission over shorter distances.

Patch cords are classified into SC, LC, FC, and so on by interface type. Typical lengths of patch cords include 0.5 m (1.64 ft), 1 m (3.28 ft), 2 m (6.56 ft), 3 m (9.84 ft), 5 m (16.40 ft), and 10 m (32.81 ft).

Pigtail cord

A pigtail cord is an optical fiber that has an optical connector on one end and a length of exposed fiber on the other. The end of the pigtail is fusion spliced to a fiber, connecting the fiber cable and transceiver.

Pigtail cords fall into single-mode (yellow) and multi-mode (orange), and can also be classified into SC, LC, FC, and so on based on interface type.

Fiber connector

Fiber connectors are indispensable passive components in an optical fiber communication system. They allow the removable connection between optical channels, which makes the optical system debugging and maintenance more convenient and the transit dispatching of the system more flexible.

Figure 60 SC connector

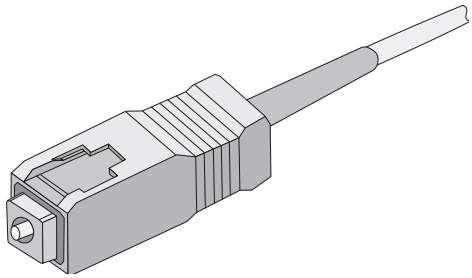
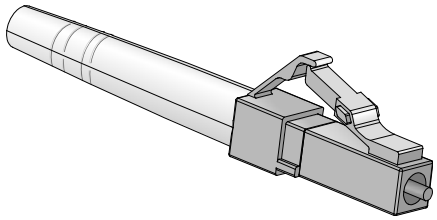


Figure 61 LC connector



Usage guidelines

Follow these guidelines when you connect an optical fiber:

- Make sure the fiber connector and fiber type match the transceiver module type.
- The fiber interfaces on some cards of the 7500 Switch Series have shielded covers. Remove the shielded covers before using the fiber interfaces. Fiber interfaces must be installed with shielded covers when they are not in use. Keep them safely.
- Fiber connectors must be protected under safe and reliable outer packing, and be fitted with dust caps. Fiber connectors must be installed with dust caps when they are not in use. Take care not to scratch their end face. Replace the dust cap if it is loose or polluted.
- Before connecting a fiber, use dust free paper and absolute alcohol to clean the end face of the fiber connector. You can brush the end face only in one direction. You also need to brush the end face of the fiber port.
- Never bend or curve a fiber when connecting it. After a fiber is installed well, the bend radius must be not less than 40 mm (the minimum dynamic bend radius is 20 D, and the minimum static bend radius is 10 D. D indicates the outer diameter of dust caps).

- If the fiber has to pass through a metallic board hole, the hole must have a sleek and fully filleted surface (the filleting radius must be not less than 2 mm). When passing through a metallic board hole or bending along the acute side of mechanical parts, the fiber must wear jackets or cushions.
- Insert and remove a plug with care. Never exert a fierce force to the fiber or plug; otherwise the plug might be damaged or the fiber might be broken. Never pull, press or extrude the fiber fiercely. For the allowed maximum tensile load and crush load, see Table 89.

SFP+ cable

You can use the SFP+ cables to connect the SFP+ ports on the 7500 switches. The SFP+ cables available for the HP 7500 Switch Series are 10 Gbps SFP+ cables, as shown in Figure 62.

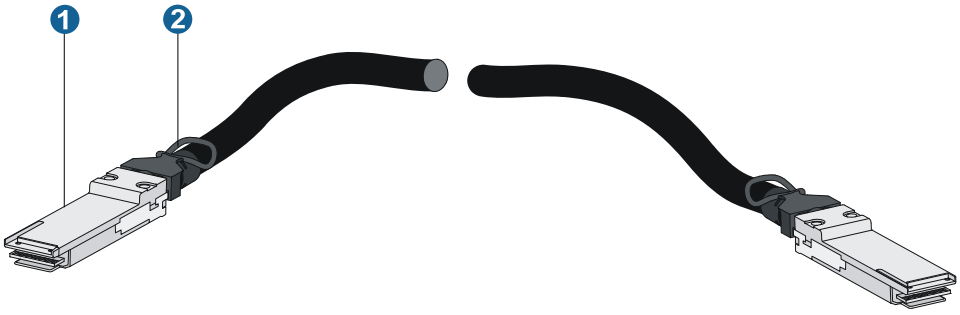
Figure 62 SFP+ cable

(1) Connector	(2) Pull latch

QSFP+ cable

You can use QSFP+ cables to connect the QSFP+ ports.

Figure 63 QSFP+ cable

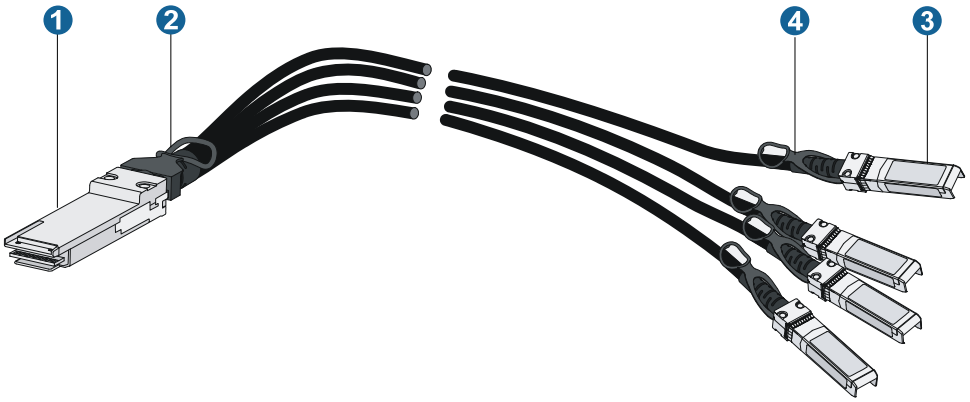


(1) Connector	(2) Pull latch

QSFP+ to SFP+ cable

A QSFP+ to SFP+ cable provides one QSFP+ connector at one end and four SFP+ connectors at the other end.

Figure 64 QSFP+ to SFP+ cable



(1) QSFP+ connector	(2) QSFP+ pull latch
(3) SFP+ connector	(4) SFP+ pull latch

Appendix E Cabling recommendations

When an HP 7500 switch is mounted in a 19 inch standard rack, the interface cables are routed through the cable management brackets, bound at cabling racks on chassis sides, and then routed up or down to pass through the chassis top or the raised floor, depending on the available equipment room condition. The power cords run along the right-rear of the chassis and out of the chassis either from the chassis top or the raised floor depending on the equipment room conditions (power distribution cabinet, lightning protection box, and connector strip, etc.) of the exchange office.

General cabling requirements

Minimum curvature radius of cables

- The curvature radius of a fixed power cord, communication cable, or ribbon cable should be at least five times the cable's outer diameter. If the cable is frequently bent, plugged and unplugged, the curvature radius should be at least seven times the cable's outer diameter.
- The curvature radius of an ordinary fixed coaxial cable should be at least seven times of the cable's outer diameter. If the coaxial cable is frequently bent, plugged and unplugged, the curvature radius should be at least 10 times the cable's outer diameter.
- The curvature radius of a high-speed cable (for example, SFP+ cable) should be at least five times of the cable's outer diameter. If the coaxial cable is frequently bent, plugged and unplugged, the curvature radius should be at least 10 times the cable's outer diameter.

Minimum curvature radius of fibers

- When the fiber is wrapped up around the cabling plate, the diameter of the cabling plate should be at least 25 times the fiber's diameter.
- When the fiber is being moved, the curvature radius of the fiber should be at least 20 times the fiber's diameter.
- When the fiber is fixed, the curvature radius of the fiber should be at least 10 times the fiber's diameter.

NOTE:

The fiber's diameter refers to the outer diameter of the fiber jacket. Typically, the diameter of a single-core fiber is 0.9 mm, 2.0 mm, or 3.0 mm (0.04 in, 0.08 in, or 0.12 in).

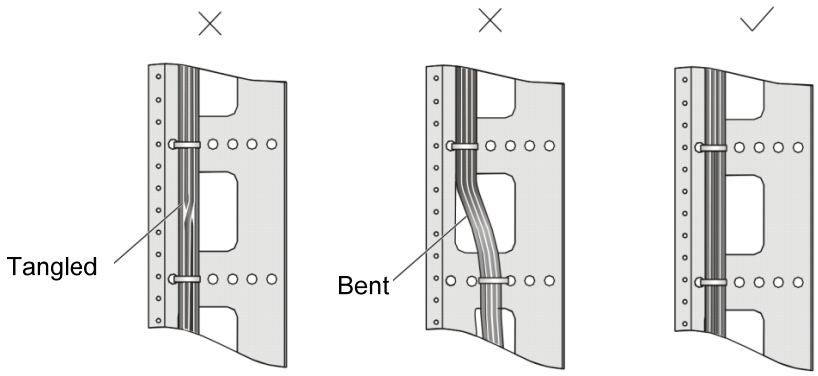
Correct use of labels

Before binding the cables, fill in the labels for them correctly and stick them to the right position on the cables.

Cable management requirements

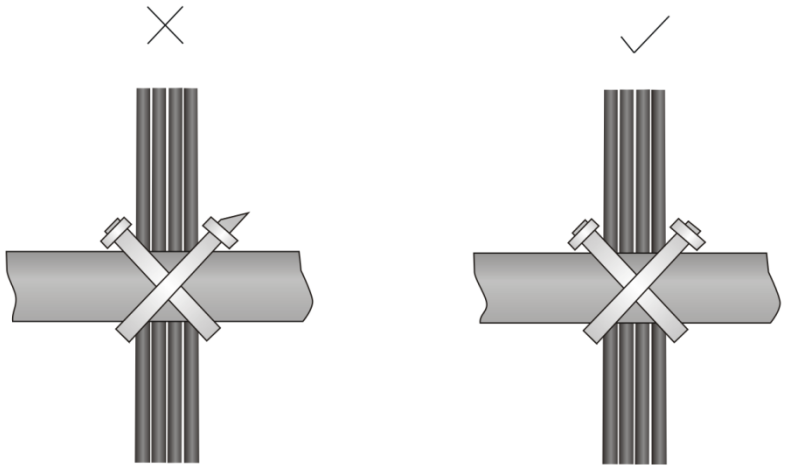
- Bind and put the cables inside the rack in an organized manner. Make sure the cables do not have any kinks or sharp bends.

  Figure 65 Cable binding example 1

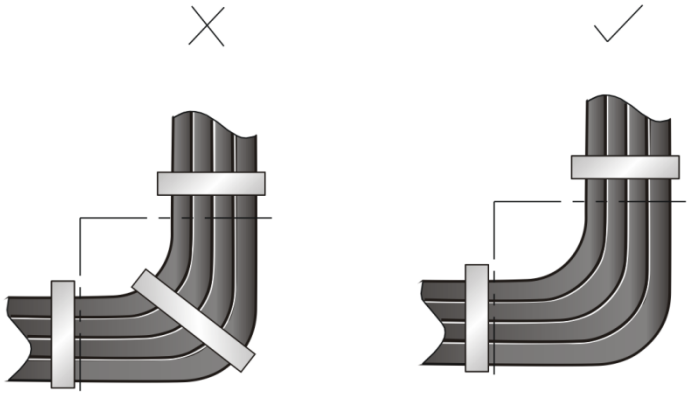
- Different cables (power, signal, and PGND cables) should be routed and bound separately rather than together in the rack. If they are close to each other, you can route them in cross-shape. For parallel routing, the space between power cord and signal cable should be no less than 30 mm (1.18 in).
- The cable management bracket and cable routing slot inside and outside the rack should be smooth and without sharp edges or tips.
- The metal cable management hole should have a smooth and fully rounded surface or wear an insulating bush.
- Use the right type of ties to bind the cables. Do not bind cables with joined ties.
- Cut the extra parts of the ties neatly after binding the cables, leaving no sharp or angular tips. See the following figure:

  Figure 66 Cable binding example 2

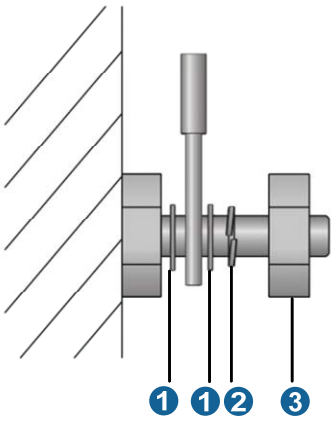
- Bind the cables wherever cable bending cannot be avoided. However, the cable ties cannot be placed inside the bending area in case of the likelihood of cable core break due to excessive stress. See the following figure.

Figure 67 Cable binding example 3



- The spare cables or excessive cable parts should be folded and bound and placed at a right place in the rack or on the cable routing slot. A "right place" refers to the place where the cables will not affect the operation of the switch or impair the switch, or be damaged.
- The power cords cannot be tied on the slide rails of any mobile components.
- Reserve some redundancy for the cables connecting to the mobile parts, the PGND cable of the door for example, to free the cables from possible stress. Such a mobile part should be installed in such a way that the extra cable segments will not contact the heat source, sharp points, or edges. Use high temperature cables against the heat sources.
- For the cable terminals fixed using screw threads, the screws or nuts should be securely fastened and prevented from loosing. See the following figure:

Figure 68 Cable fixing example



(1) Flat washer	(2) Spring washer	(3) Nut

- When using a hard power cord, fix it near its terminal to free the terminal and the cable from stress.
- Do not use tapping screws to fasten the connecting terminals.
- The power cord of the same type and in the same direction should be bound together and kept organized.
- The following table lists the requirements in the binding with cable ties.

Table 90 Tie-binding parameters

Cable bundle diameter (mm)	Space between bundles (mm)
10	80 to 150
10 to 30	150 to 200
30	200 to 300

- No cable or bundle can tie a knot.
- The metal parts of the crimped cold-pressed terminal blocks (such as air switch) cannot stretch beyond the blocks.

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